CLASS 156, ADHESIVE BONDING AND MISCELLANEOUS CHEMICAL MANUFACTURE

SECTION I - CLASS DEFINITION

This is the generic class for:

1. Manufacturing processes and apparatus including a step of adhesively bonding parts together utilizing a nonmetallic cement or assembly of parts for adhesive bonding of that type.

2. The manufacture of articles of commerce in which one of the manufacturing steps includes a chemical reaction.

3. The manufacture of panels from settable inorganic compositions having adhered facing sheets (e.g., plaster board). See Subclass References To The Current Class for these processes and apparatus. The subclasses referenced therein should be examined for the precise limits of the subject matter provided for and for additional fields of search.

4. The manufacture of electrical conductors of indefinite length where not elsewhere provided for. See Subclass References To The Current Class for these processes. The subclasses referenced therein and notes thereto should be consulted for the precise limits of the subject matter there provided for.

Miscellaneous Subject Matter Also Provided For

1. This class includes several subclasses relating to the manufacture of simulations or representations, that is articles which give the appearance of being a specific object without in fact being that object. Also provided is a subclass relating to the preparation of products of nature for display in their natural form. This class also includes processes not elsewhere provided for in which is recited a step of free hand drawing or shaping to produce an ornamental form. See Subclass References to the Current Class, below, for specific cites. The subclass definitions for all the above areas should be inspected and especially the notes thereto for the lines between these specific subclasses and other classes.

2. Apparatus for performing shaping operations, per se, on dry paper or paperlike materials are provided for in this class. See Subclass References to the Current Class, below, for specific cites. The lines with various classes and analogous search fields are set out in the subclasses mentioned there.

3. Delaminating. This class provides for the separation of a bonded joint by destroying the bond and separating the parts. See Subclass References to the Current Class, below, for subclasses for methods for delaminating and corresponding apparatus.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

SPECIAL LINES WITH CLASS 29, METAL WORKING

Class 29 has several important relationships with this class (156). Both classes take designated single-step processes, and both are locations for multistep processes for manufacturing designated products or using certain combinations of steps.

Single-step processes provided for in Class 29 include shaping particulate metal by pressure alone, burnishing, filing, mechanical joining of parts, etc., even when used in the manufacture of a product designated for Class 156, in section I, above. Likewise, where only an adhesive bonding step is claimed, the process is assigned to Class 156, even though a product designated for Class 29 is manufactured.

Multistep processes for Class 29 are of two types: (1) Those for making specified articles, enumerated in that part of the Class 29 subclass 401.1. (2) Multistep manufacturing processes not provided for elsewhere.

Insofar as processes of type (1) are concerned, these are assigned to Class 29, even when an adhesive bonding step is claimed as part of the multistep process, except for processes classifiable in subclasses 825+, which follows the category (2) rule given in the next paragraph.

Processes of type (2) are provided for in this class (156) when they claim: (a) Adhesive bonding combined with shaping of nonmetals. (b) Adhesive bonding combined with broad or nominally claimed metal shaping steps. (c) Adhesive bonding including steps for assembling the parts to be bonded.

Processes of type (2) are classified in Class 29 when they claim: (a) Adhesive bonding combined with specified metal shaping steps. (b) Adhesive bonding combined with mechanical joining, either broad or specific.

A. Bonding And/Or Assembly Therefor.

1. This class provides for the adhesive securing of parts utilizing nonmetallic cementing media. The adhesive may be separately applied tacky material, or it may be a nontacky material on application that is subsequently activated. The parts joined may be inherently tacky without the addition of an adhesive or may be rendered tacky by the application of an activating material or agent.

2. This class provides for process for assembling adhesive coated or tacky parts even though the step of applying the adhesive may not be claimed. Assembly or association of articles for subsequent bonding or adhesive applying where the subsequent bonding is not claimed is generally not provided for in this class. Any step in addition to the assembly, however, which might be considered to be unique to adhesive bonding is sufficient to cause the patent to be classified in this class.

3. This class provides for apparatus for assembling and joining of parts. Generally it is required that the apparatus include means to bring the parts into assembled association and that the parts have adhesive applied to them or means be claimed to apply adhesive or render the parts adhesive. This class generally does not provide for apparatus for bringing parts together for subsequent adhesive application where such application is not claimed. Appropriate classes are listed in References to Other Classes, below. Class 29, Metal Working, especially provides for such devices.

B. Laminating Combined With Other Operations

1. This class provides for the combination of laminating with other working steps, however other classes provide for laminating for the manufacture of specific articles, or particular operations combined with laminating steps. See References to Other Classes, below, referencing this section.

C. Chemical Manufactures

1. Etching apparatus in general is provided for in Class 134, Cleaning and Liquid Contact With Solids, except apparatus for (a) applying etchant to a restricted portion of a product or (b) causing the etchant to be applied differently to different areas of the product Class 156 (subclasses 345.1-345.55). Attention is directed to the search notes of these subclasses for the locus of other art relating to this subject matter. Processes and apparatus for electrolytic etching are provided for in Class 204, Chemistry: Electrical and Wave Energy.

2. Class 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, Class 427, Coating Processes, and Class 264, Plastic and Nonmetallic Article Shaping or Treating: Processes, generally provide for chemical reactions which take place during photos:graphic imaging, coating or molding steps, respectively. Where etching is employed merely to prepare a surface for some subsequent operation, e.g., coating, welding, etc., the patent to the combination is classified with the subsequent operation. Also, imaging or coating combined with subsequent chemical etching is provided for in Class 430 or 427, while molding combined with subsequent reactive gas or vapor treatment is provided for in Class 264.

3. Class 29, Metal Working, provides for its own operations when combined with a coating step or a molding step. See also "A. Bonding And/Or Assembly Therefor" above.

See References to Other Classes, below, referencing this section.

D. Single-crystal Growth

1. This subject matter is located in Class 117, Single-Crystal, Oriented-Crystal, and Epitaxy Growth Processes; Non-Coating Apparatus Therefor.

E. Products

This class does not provide for products of manufacture. Class 428, Stock Material or Miscellaneous Articles, in appropriate subclasses provides for the products resulting from the processes of this class where not elsewhere provided for. For the classification of other articles, attention is directed to the "Index to Classification".

LINE WITH CLASS 228 AND CLASS 219

See Class 228, Metal Fusion Bonding, appropriate subclasses for joining of parts by metallurgical bonding and also see Class 219, Electric Heating, for welding of metals by electric heating. (for apparatus bringing parts together for adhesive application, not claiming application)

SECTION III - SUBCLASS REFERENCES TO THE CURRENT CLASS

SEE OR SEARCH THIS CLASS, SUBCLASS:

39+, and 346+ for, respectively, the apparatus and the processes for the manufacture of panels from settable inorganic compositions having adhered facing sheets (e.g., plaster board). The definitions and notes to these subclasses should be examined for the precise limits of the subject matter provided for and for additional fields of search.

47+, for processes of the manufacture of electrical conductors of indefinite length where not elsewhere provided for. The subclasses referenced therein and notes thereto should be consulted for the precise limits of the subject matter there provided for.

57, for preparation of products of nature for display in their natural form.

58, 59, 61, for manufacture of simulations or representations, that is articles which give the appearance of being a specific object without in fact being that object).

62, for processes not elsewhere provided for in which is recited a step of free hand drawing or shaping to produce an ornamental form.

344, for methods for delaminating.

584, for apparatus for delaminating.

585+, for apparatus for performing shaping operations, per se, on dry paper or paperlike materials. The lines with various classes and analogous search fields are set out in this subclass.

SECTION IV - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

2, Apparel, subclasses 243+ for processes for making apparel including a cementing step combined with other apparel manufacturing steps. (see "Laminating combined with other operations" above)

7, Compound Tools, appropriate subclasses for laminating tools combined with other working devices. (see "Laminating combined with other operations" above)

12, Boot and Shoe Making, appropriate subclasses for shoe making including laminating. (see "Laminating combined with other operations" above)

15, Brushing, Scrubbing, and General Cleaning, appropriate subclasses, for laminating implements there provided for of the brush or wiper type. (for apparatus bringing parts together for adhesive application, not claiming application)

15, Brushing, Scrubbing, and General Cleaning, subclasses 105+ for tools of that class when combined with some other tool even though the Class 15 tool may be disclosed as having a laminating function. See "A. Bonding And/Or Assembly Therefor" above for the line between Class 15 and Class 156 as to tools, per se. (see "Laminating combined with other operations" above)

26, Textiles: Cloth Finishing, subclasses 3+ for cloth singeing and general textile cloth finishing. (see "C. Chemical Manufactures" above)

28, Textiles: Manufacturing, appropriate subclasses as the generic class for textile operations, and especially subclasses 167+, 178+, 261, and 265+ for significantly claimed textile operations combined with steps of coating, dyeing or fluid treatment. (see "C. Chemical Manufactures" above)

28, Textiles: Manufacturing, subclasses 107+ for the formation of a textile product by mechanically interlocking or interengaging of threads, yarns, fibers or the like in a manner not provided for elsewhere, such as by needling.(for apparatus bringing parts together for adhesive application, not claiming application)

29, Metal Working, subclasses 2 through 25.42 , 91 through 91.8, 592.1 through 623.5, and 825 through 899.1 for combined apparatus or processes for making specific articles set forth even though an adhesive bonding be claimed. This class (156) can provide for manufacture of these arti where a laminating step only is claimed. Subclasses 33 and 700 through 285.5 of Class 29 provide for assembly and shaping combined with other manufacturing means or steps. See subclasses 592.1 through 887 of Class 29 for the residual home for methods of making electrical devices and sub 729 through 761 for corresponding apparatus. See the Class Definition of this class (156) for those articles for which Class 156 is the resid manufacturing class.

43, Fishing, Trapping, and Vermin Destroying, subclass 42.53 for combined processes for making artificial fishing lures or bait. (see "Laminating Combined With Other Operations" above)

51, Abrasive Tool Making Process, Material, or Composition, and especially subclass 297 for an abrasive tool making process which may

involve a laminating step. (see "Laminating Combined With Other Operations" above)

51, Abrasive Tool Making Process, Material, or Composition, for a process for making an abrading tool and see especially the notes therein for the lines with other classes. (see "C. Chemical Manufactures" above)

52, Static Structures (e.g., Buildings), subclasses 746.1+ for a process involving erection or assembly of a building or building component involving more than merely adhering a preformed sheet form member to a surface. (see "Laminating Combined With Other Operations" above)

53, Package Making, appropriate subclasses for laminating operations, per se, peculiar to package making. That class provides for adhesively sealing a filled package where package handling means are claimed. Class 53 also provides for adhering encircling sealing strips (subclass 137.2) which seal portions of cover, i.e., cover adjuncts. Partial cover application, such as cigar bands, for example, are provided for in Class 53, subclass 580, especially where the band is secured to itself. (for apparatus bringing parts together for adhesive application, not claiming application)

53, Package Making, appropriate subclasses for package making including a laminating step and see "A. Bonding And/Or Assembly Therefor" above for the line with Class 53. (see "Laminating Combined With Other Operations" above)

57, Textiles: Spinning, Twisting, and Twining, subclasses 3+, 210, and 362 for covering or wrapping cores of indefinite length when including or followed by a twisting or twining operation. (see "Laminating Combined With Other Operations" above)

65, Glass Manufacturing, subclass 31 for a process involving a glassworking operation combined with an etching operation in any sequence. (see "C. Chemical Manufactures" above)

65, Glass Manufacturing, subclasses 36+ for a process of bonding glass by glassworking operation to a formed part, and see the line note in subclass 36; especially see subclasses 37+ for multi-focal lens making including fusion bonding, and see the line note in subclass 37; subclass 42 for a process of glassworking including bonding of a subassembly with subsequent assembly and bonding of formed parts only, and see the line note in subclass 42). (for apparatus bringing parts together for adhesive application, not claiming application)

76, Metal Tools and Implements, Making, subclasses 101.1+ for metal tool and implement making processes which may involve a laminating step. (see "Laminating Combined With Other Operations" above)

99, Foods and Beverages: Apparatus, subclasses 450.1+ for apparatus for making a composite edible by laminating preforms. (for apparatus bringing parts together for adhesive application, not claiming application)

100, Presses, for press apparatus, per se, even where disclosed for performing a laminating function. That class (100) can take feeding of a previously associated sandwich into the press couple or removal of the sandwich from the couple. Mere heating in the press is also provided for in Class 100, subclasses 300+ as is means placing the material pressed under vacuum during pressing (subclass 90). This class (156) provides for pressing and for laminating not provided for in Class 100, i.e., (1) pressing combined with means peculiar to laminating or (2) presses modified uniquely for laminating. Under (1) above, means associating or assembling parts before pressing, for example, is in this class (156). In subclasses 580+ of this class may be found certain presses, per se, or platen structures modified for laminating. Thus, for example, under (2) above and in these subclasses may be found press platens having relieved areas whereby the pressed sandwich is bonded at spaced points, differentially heated platens to achieve the same effect. (for apparatus bringing parts together for adhesive application, not claiming application)

101, Printing, appropriate subclasses provides for the transfer of sheet-like material onto a base where the transfer element is a printing member of the type provided for in that class. Die printing with gold leaf, for example, is provided for in that class (101) when a ribbon of leaf is used and a portion thereof is impressed and adhered onto the base by a printing member. (for apparatus bringing parts together for adhesive application, not claiming application)

101, Printing, subclass 463.1, for processes for making printing plates and surfaces there provided for. (see "C. Chemical Manufactures" above)

114, Ships, subclass 86 for ship calking and seaming and subclass 224 for implements performing this function. (for apparatus bringing parts

together for adhesive application, not claiming application)

118, Coating Apparatus, appropriate subclasses for devices which only apply adhesive to parts previously associated. Any manipulation of the parts to facilitate lamination or manipulations peculiar to lamination are excluded from this class (118). Thus, for example, separating parts to insure flow of adhesive there between is provided for in Class 156. (for apparatus bringing parts together for adhesive application, not claiming application)

131, Tobacco, subclasses 290+ for tobacco treating processes. (see "C. Chemical Manufactures" above)

131, Tobacco, appropriate subclasses for cigar and cigarette making combined with laminating.

134, Cleaning and Liquid Contact With Solids, for cleaning processes and especially subclass 2 and 3 for chemical bleaching, oxidation or reduction of a metallic, siliceous or calcareous base. That class (134) also provides for apparatus for contacting solid workpieces with an etchant fluid. Class 156 provides for etching apparatus in which the etchant has a differential effect on the work. (see "C. Chemical Manufactures" above)

144, Woodworking, subclasses 3.1+ for a machine for charring or burning wood.. (see "C. Chemical Manufactures" above)

157, Wheelwright Machines, subclasses 1.1+ for rubber tire mounting or demounting apparatus. (for apparatus bringing parts together for adhesive application, not claiming application)

162, Paper Making and Fiber Liberation, subclasses 123+ for processes for producing multilayer water-laid sheets or webs. (for apparatus bringing parts together for adhesive application, not claiming application)

162, Paper Making and Fiber Liberation, appropriate subclasses for the combination of paper making and laminating. (see "Laminating Combined With Other Operations" above)

164, Metal Founding, subclasses 91+ for processes of forming composite articles by a metal casting operation. (for apparatus bringing parts together for adhesive application, not claiming application)

165, Heat Exchange, subclasses 168+ for heated surfaces or heat exchange members, per se, which may function to apply laminating heat to a work piece. (for apparatus bringing parts together for adhesive application, not claiming application)

219, Electric Heating, appropriate subclasses for electric heating of metals for welding. That class (219) also provides for electric heaters, per se, which may be used for adhesive bonding and for heated couples not specifically modified to provide for a laminating function. (for apparatus bringing parts together for adhesive application, not claiming application)

227, Elongated-Member-Driving Apparatus, appropriate subclasses, for joining by mechanical means there provided for. (for apparatus bringing parts together for adhesive application, not claiming application)

228, Metal Fusion Bonding, appropriate subclasses for joining of parts by metallurgical bonding. (See Lines With Other Classes and Within This Class, above.)

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses for processes within the class definition, for casting or molding operations which may include a uniting operation. Class 264 provides for casting a part onto a preform to form a composite article and also provides for uniting two or more spaced preforms by introducing fluent material therebetween. For a more comprehensive line between Classes 156 and 254 see the class definitions of Class 264. (for apparatus bringing parts together for adhesive application, not claiming application)

223, Apparel Apparatus, appropriate subclasses for garment making apparatus which may include laminating means in combination therewith.

227, Elongated-Member-Driving Apparatus, subclass 14 for apparatus for applying a member, e.g., nail, to a workpiece combined with means to apply cement to the workpiece for a securing purpose. (see "Laminating Combined With Other Operations" above)

242, Winding, Tensioning, or Guiding, subclasses 551+ for unwinding an elongated material with attachment to a preceding material including means to unite material ends together to insure a continuous supply. The art in Class 242 typically handles rolls or spools in addition to unwinding. (see "Laminating Combined With Other Operations" above)

300, Brush, Broom, and Mop Making, appropriate subclasses, for processes for making the finished articles there provided for by a bonding step. (for apparatus bringing parts together for adhesive application, not claiming application)

404, Road Structure, Process, or Apparatus, appropriate subclasses under 72+ and 83+, for a road

and pavement making process and apparatus which may include a step of bonding or a means for bonding. (for apparatus bringing parts together for adhesive application, not claiming application)

404, Road Structure, Process, or Apparatus, subclasses 72+ for a process of making a roadway which may include the step of setting or curing road material. (see "C. Chemical Manufactures" above)

404, Road Structure, Process, or Apparatus appropriate subclasses under 72+ and 83+ for a road and pavement making process and apparatus which may include a step of laminating or a means for laminating. (see "Laminating Combined With Other Operations" above)

412, Bookbinding: Process and Apparatus, appropriate subclasses for specific book making steps or apparatuses combined with laminating. This class (156) provides for making single book elements, such as laminated book covers, even though the plural manufacturing steps may be claimed. (see "Laminating Combined With Other Operations" above)

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, appropriate subclasses as the residual class for apparatus involving chemical procedures. (see "C. Chemical Manufactures" above)

423, Chemistry of Inorganic Compounds, as the parent class for processes involving a chemical reaction. (see "C. Chemical Manufactures" above)

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, for radiation imagery including an etching step. (see "C. Chemical Manufactures" above)

436, Chemistry: Analytical and Immunological Testing, for processes and compositions for qualitative or quantitative chemical testing especially subclass 4 for a chemical determination of properties of a crystal or crystalline materials. (see "C. Chemical Manufactures" above)

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 110+ for apparatus uniting parts within a mold cavity or for making a composite article from a preform and fluent material by casting thereof in a mold. (for apparatus bringing parts together for adhesive application, not claiming application)

427, Coating Processes, for coating, per se, with adhesive material even where the adhesive is disclosed as for the purpose of laminating. Class 427 also provides for coating previously associated parts where association is not claimed. (for apparatus bringing parts together for adhesive application, not claiming application)

505, Superconductor Technology: Apparatus, Material, Process, subclasses 300+ for processes of producing high temperature ($T_c > 30$ K) superconductors. (for apparatus bringing parts together for adhesive application, not claiming application)

445, Electric Lamp or Space Discharge Component or Device Manufacturing, appropriate subclasses for processes there provided for which may include chemical manufacturing steps. (see "C. Chemical Manufactures" above)

445, Electric Lamp or Space Discharge Component or Device Manufacturing, subclass 2, 23+, 61 and 66+ as the residual class for the manufacture of electric lamp and discharge devices and see especially the class definition thereof for the locus of other patents relating to the manufacture of these devices. (see "Laminating Combined With Other Operations" above)

493, Manufacturing Container or Tube From Paper; or Other Manufacturing From a Sheet or Web, appropriate subclasses for manufactures which includes a laminating or adhesive bonding step. That Class 493 generally manufactures finished articles of commerce from paper or paperlike materials and is the generic class for the manufacture of the specific articles there provided for. Class 156 provides for subcombinations of laminating single seams in the manufacture of those articles and also provides for tube making methods involving a laminating step. See the line note under the definition of Class 493 to this class (156) for further clarification of the lines between these classes. (see "Laminating Combined With Other Operations" above)

505, Superconductor Technology: Apparatus, Material, Process, subclasses 300+ for processes of producing high temperature ($T_c > 30$ K) superconductors. (see "Laminating Combined With Other Operations" above)

505, Superconductor Technology: Apparatus, Material, Process, subclasses 300+ for processes of producing high temperature ($T_c > 30$ K) superconductors. (see "C. Chemical Manufactures" above)

588, Hazardous or Toxic Waste Destruction or Containment, appropriate subclasses for the destruction or containment of hazardous or toxic waste. (see "C. Chemical Manufactures" above)

SECTION V - GLOSSARY

ADHESIVE BOND

The joining of parts (a) by means of a separate glue-like material or (b) by rendering contacting surfaces tacky by means of solvent and/or heat.

BENDING

Distortion of a workpiece by bodily moving a portion of it throughout its entire thickness relative to a second portion during which the thickness of the workpiece remains substantially the same and no significant plastic flow occurs.

BULK DEPOSITION OF PARTICULATE MATERIAL

The fluent delivery of a stream of separate loose pieces onto a receiving surface. The relative size of the pieces is not significant, rather it is the manner in which they are handled, as a mass or stream rather than each particle being individually manipulated.

INDEFINITE LENGTH WORK

A piece of material handled at points intermediate its ends whereby the length is immaterial to the manner of handling.

LAMINA

One of the component parts or layers of an adhesively bonded sandwich. Also an element which by disclosure is to be bonded to a separate element.

SUBCLASSES

1 This subclass is indented under the class definition. Methods for the manufacture of articles .

SEE OR SEARCH THIS CLASS, SUBCLASS:

345.1 through 345.55 , for differential etching apparatus.

39 This subclass is indented under subclass 1. Processes which are directed to making bodies having at least three layers, at least one of whose intermediate layers is composed of an inorganic settable material of structural strength, and whose outermost layers are of a sheet-like material.

(1) Note. The primary function of the inorganic settable material is to give structural strength to the multi-layered body.

(2) Note. The inorganic settable material is normally referred to as the core and the outer layer as the facing sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:

346+, for plaster board making type of apparatus.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, subclasses 638+ for coating compositions containing an inorganic settable material.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses for processes within the class definition for casting a settable material onto a surface and stripping therefrom when not combined with the step of adhering facing sheets to the settable material. subclass 333 therein pertains to processes utilizing heat or pressure indicating, mold or die shaping of inorganic hydraulic settable materials, not classifiable above.

427, Coating Processes, appropriate subclass, for processes of coating a substrate.

428, Stock Material or Miscellaneous Articles, subclasses 304.4+ for a composite stock material web or sheet including a porous or cellular layer, and the appropriate subclasses under subclasses 411+ for a nonstructural "plaster-board" plural layer product.

40 This subclass is indented under subclass 39. Processes combined with the step of folding and/or bending at least one facing sheet.

(1) Note. See subclasses 196 and 226 of this class for definitions of the scope of the terms "bending" and "folding", respectively.

(2) Note. Included in this subclass are processes of bending a single facing sheet into a trough-like shape and applying the core material to the trough thus formed.

(3) Note. This subclass also includes processes wherein a single facing sheet completely envelopes the core material.

(4) Note. Processes wherein a facing sheet is turned about the edges of the core material and embedded therein are included in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
196+, for processes of bending or reshaping a self-sustaining lamina.

41 This subclass is indented under subclass 39. Processes which include the step of coating a facing sheet of, the assembled body, or adding an ingredient to the core material which coating or added ingredient renders the plasterboard impervious to the passage of water.

42 This subclass is indented under subclass 39. Processes which include the envelopment of an additional element by the core material which element imparts additional structural strength to the completed plasterboard.

(1) Note. The additional element may be fibers, rods, tubes or any other material which adds structural strength to the core material.

(2) Note. The reenforcing elements may be added during the formulation of the core material.

43 This subclass is indented under subclass 39. Processes which include the step of causing the core material to become cellular in nature after association of the core material with at least one of the facing sheets.

(1) Note. The addition of activatable foaming agents, beating, or heating of gas generating materials are some examples of the means used to cause the core to become cellular.

44 This subclass is indented under subclass 39. Processes in which at least one of the facing sheets is subjected to a mechanical and/or chemical modification prior to the association of the various layers.

(1) Note. Trimming, roughening, perforating, application of adhesive, printing, and coating are some examples of the types of treatments herein included.

45 This subclass is indented under subclass 39. Processes in which the unitary body formed by the association of the facing sheets and core material is thereafter subjected to a chemical and/or mechanical modification.

(1) Note. Edge smoothing, cutting, manipulative drying techniques, coating, printing and manipulative pressure application are some examples of the type of modifications herein included.

46 This subclass is indented under subclass 45. Processes in which the modification is the formation of an aperture.

(1) Note. The aperture need not necessarily extend through the entire body but may stop short of penetrating the second facing sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:
252, for processes of forming apertures in lamina.

47 This subclass is indented under subclass 1. Processes for making indefinite length electrical conductors or for joining, splicing or repairing the same.

(1) Note. The term "conductor" as used herein, means any wire, strand, filament bar, rod, cable, cord, tube, or like element, of indefinite length, simple or compound, bare or insulated, designed

and intended to provide an electrically conductive path between its end.

(2) Note. This class is a residual class for miscellaneous patents pertaining to the above subject matter and which cannot be classified elsewhere. The bulk of the patents relating to this subject matter is to be found in the various manufacturing apparatus and process classes referred to in the following notes. The definitions of these classes should be consulted to determine the scope and limitations thereof, this class (156) taking only those patents which cannot be properly allocated to any other manufacturing class. The following notes refer to those classes in which conductor manufacturing and other immediately related processes and apparatus are known to exist, but are probably not exhaustive.

(3) Note. METAL WORKING OPERATIONS For the making, forming, or shaping of wires, rods, tubes, cables, or other metallic elements, either simple or compound, or for the covering or sheathing of wires, rods, etc., either insulated or not, by mere metal working operations; see "SEARCH CLASS" below with reference to Metal Working Operations.

(4) Note. The above classes also provide for certain subsidiary or miscellaneous operations encountered in the manufacture of electric conductors or otherwise of interest therein as set forth in (15) note.

(5) Note. For mere twisting or twining of metal strands, wires, etc., or for mere coating operations with metal, see notes (9) and (12), respectively, as well as their Search Class notes below.

(6) Note. In general, the above classes may be said to be restricted to metal working operations, or to such operations combined with certain subsidiary operations which are merely incidental to the metal working. However, exceptions are found in Class 29, Metal Working, in which subclasses 90.01, 400.1 and 700 and their indented subclasses are the generic places for the operations provided for therein regardless of the material worked on. Thus, for example, for the threading or assembling of beads, discs, or other spacer members, whether of metal or not, on wires, as in coaxial cables, see Class 29, subclass 729.

(7) Note. Plural or combined operations, each of which is a metal working operation, are also included in the above classes, Class 29, Metal Working taking all such combined operations not provided for in the other metal working classes. Accordingly, patents relating to the manufacture of electric conductors wherein each operation involves metal working, will be classified in one of the above classes, but where, in addition to the metal working, an operation not merely subsidiary thereto is claimed, as, for example, the coating or covering of a wire insulation prior or subsequent to the metal working, such patent will be classified in Class 156.

(8) Note. TEXTILE WORKING OPERATIONS For the making or forming of cords, cables, or other strands, including conductors, or for the covering or sheathing of such elements by mere textile working operations; see "SEARCH CLASS" below.

(9) Note. In general, these textile classes are restricted to textile working operations, by which is meant the working, manipulating, or interengagement of fibers, filaments, strands, etc., to produce fabric structures. The filaments, strands, etc., may be of metal where no particular metal working is involved. Thus, for example, Class 57, Textiles: Spinning, Twisting, and Twining, will take the mere twisting or twining of one or more metallic strips, tapes, wires, etc., to form wire-rope, cables, etc., or to cover a core therewith.

(10) Note. Textile working operations combined with subsidiary or auxiliary operations such as, for example, coating or impregnating of the fibers or strands, or of the core, or of the completed article,

with fluid or plastic material are also included.

(11) Note. Plural or combined operations each of which is a textile working operation (e.g., twisting or twining plus braiding or knitting) are also included, Class 28, Textiles: Manufacturing, taking such residual combined operations not provided for in the other textile classes. Accordingly, patents relating to the manufacture of electric conductors wherein each operation is a textile working operation are classifiable in one of the above classes, but where, in addition to the textile working, an operation not merely subsidiary thereto is claimed, as, for example, applying a metallic sheath by drawing or rolling prior or subsequent to the textile working operation, such patent will be classified in Class 156.

(12) Note. COATING, COVERING AND SHEATHING. For coating, covering, or sheathing conductors by metal working operations or by textiles working operations, see the classes listed under these respective headings above. For other apparatus or processes for forming or applying a coating, sheathing, or other covering on a conductor, cable, or other strand; see "Search Class" below. Classes 118, 148, 204, and 427, include coating with metal, when applied by the operations provided for in these classes.

(13) Note. STRUCTURE. For the structure of electric conductors or for analogous strand structures, including pipes, hose and conduits, see the Search Class notes below.

(14) Note. MISCELLANEOUS For methods or apparatus for installing or laying conductors, drawing them through conduits, or placing them on poles; see "Search Class" below referencing this Note.

(15) Note. MISCELLANEOUS. See the Search Class notes below to miscellaneous apparatus and processes used in the manufacture of electrical conductors or otherwise of interest therein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

166+, for processes of associating flexible filamentary material of indefinite length not especially intended to provide an electrically conductive path between its ends. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

169+, for processes of winding filamentary material of indefinite length to form electric coils. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

SEE OR SEARCH CLASS:

19, Textiles: Fiber Preparation, especially subclass 145 for fiber liberation from natural sources by mechanical treatment and the assembly of fibers to form slivers or webs. (See Note, above, to Textile Working Operations)

28, Textiles: Manufacturing, for miscellaneous textile operations not otherwise provided for. (See Note, above, to Textile Working Operations)

29, Metal Working, subclasses 400.1+, for processes of making miscellaneous devices; particularly subclasses 402.01+ for miscellaneous processes of repairing; subclass 461 for spreading cable strands and joining the cable to another part such as a driving block or to another cable; and subclasses 505+, particularly subclasses 518 and 519 for joining wire or cable ends together by means of a deformed surrounding sleeve. Search subclass 728 for apparatus for sheathing a running-length core, e.g., a wire, not elsewhere classified. (See note, above to Metal Working Operations.)

29, Metal Working, subclass 90.01 and 90.5 for smoothing, compacting, polishing etc., of bare or covered conductors or other strands (analogous and related operations are set forth in the notes to subclass 90.5 of Class 29), subclasses 592.1+, for processes for forming miscellaneous electrical

devices. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

30, Cutlery, subclasses 165+ for wire cutting tools and implements. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

34, Drying and Gas or Vapor Contact With Solids, especially subclasses 245+, 414, 419, 444, 466, 519, and 611+ for the drying of sheets, webs or strands including conductors and cables. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

57, Textiles: Spinning, Twisting, and Twining, especially subclasses 3+, 33, 261, and 362 for the manufacture of conductors by spinning or twisting or for covering or sheathing by wrapping. (See Note, above, to Textile Working Operations)

65, Glass Manufacturing, subclasses 36+ for a process of bonding glass to a formed part by a glassworking operation; and subclasses 152+ for glassworking apparatus including fusion bonding means; see the "Search Notes" under subclass 154. (See note, above, to Coating, Covering And Sheathing.)

66, Textiles: Knitting, especially subclasses 9+, 61, 80, and 83+ for manufacturing or covering a conductor involving a knitting apparatus. (See Note, above, to Textile Working Operations)

72, Metal Deforming, appropriate subclasses, for a method or means for making a metal conductor by a mere metal working operation, e.g., subclasses 253.1+ for die-expressing an elongated metal product, or 274+ for drawing a wire through a die. Sheathing a core, e.g., a wire by extruding a metal blanket around it is classified in subclasses 253.1+, and particularly subclass 268, this being the sole exception to the general rule that assembly is excluded from Class 72. Other sheathing, even if a metal working operation is involved, is in Class 29, Metal Working. See the note above to Class 29. (See note, above to Metal Working Operations.)

73, Measuring and Testing, subclass 40.5 for processes and apparatus for testing for leaks in fluid filled cables. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

83, Cutting, appropriate subclasses, for method and apparatus for cutting a wire or strand, a cable, or an object made up of strands, or for cutting insulation from a wire. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

87, Textiles: Braiding, Netting, and Lace Making, especially subclass 1, 6, 23, and 29 for manufacturing or covering a conductor involving braiding, netting or lace making. (See Note, above, to Textile Working Operations)

111, Planting, subclass 5 for apparatus and methods for planting pipe or cable. (See "Miscellaneous" Note above for installing or laying conductors, etc.)

118, Coating Apparatus, subclass 420, and see the notes thereto for apparatus for coating strand form work. (See note, above, to Coating, Covering And Sheathing.)

134, Cleaning and Liquid Contact With Solids, particularly subclass 9, 15, 38, 64, and 122 for cleaning strands including the removal of insulating coating. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

139, Textiles: Weaving, for manufacturing or covering a conductor involving a weaving operation. (See Note, above, to Textile Working Operations)

140, Wireworking, especially subclass 71 and 149 for the making of conductors involving wireworking. (See note, above to Metal Working Operations.)

140, Wireworking, subclass 92.1 for forms and frames for forming wire coils, such as armature coils, and subclass

147 for wire straightening. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

148, Metal Treatment, particularly subclasses 206+ for processes of carburizing or nitriding metal, utilizing an external source of carbon or nitrogen, or subclasses 240+ for processes of reactive coating a metal surface with an externally supplied agent that combines with the metal substrate to provide a coating thereon containing at least one element from said metal substrate. (See note, above, to Coating, Covering And Sheathing.)

162, Paper Making and Fiber Liberation, particularly subclass 106 and 267+ for covering operations involving paper making or fibrous pulp molding. (See note, above, to Coating, Covering And Sheathing.)

164, Metal Founding, subclass 462 for methods of forming conductors by a continuous metal casting operation and subclasses 418+ for corresponding apparatus. (See note, above to Metal Working Operations.)

174, Electricity: Conductors and Insulators, appropriate subclasses and notes (2) to (14) of the class definition thereof. As between this class (156) and Class 174, the article controls classification, i.e., patents claiming both conductor structure and the method or apparatus for making it will be classified in Class 174 and cross-referenced to Class 156. For a stock material product, not elsewhere provided for, in the form of a rod, strand or fiber, having some structural feature and an impregnation or core, or coated, see subclasses 364+ of Class 428, Stock Material or Miscellaneous Articles. (See Note above to "Structure")

204, Chemistry: Electrical and Wave Energy, for coating by electrophoresis or cathode sputtering. (See note, above, to Coating, Covering And Sheathing.)

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, especially subclasses 138+ for coating by electrolysis. (See note, above, to Coating, Covering And Sheathing.)

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclass 77 for electroforming a metallic sheet, web, wire, or filament of indeterminant length. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

219, Electric Heating, subclasses 603+ and 50+ for making or covering conductors involving electric heating and working of metal. Note especially indented subclasses 59.1+ and 605. (See note, above to Metal Working Operations.)

226, Advancing Material of Indeterminate Length, appropriate subclasses for methods of, and apparatus for, feeding material without utilizing the leading or trailing ends to effect movement of the material. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

228, Metal Fusion Bonding, subclasses 126+ for assembling and bonding together a metal core and sheath. (See note, above to Metal Working Operations.)

242, Winding, Tensioning, or Guiding, subclasses 430+ for forming an article by winding material onto a core and subclasses 470+ for winding strand material onto a spool for storage. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 134.3+ for placing cable on poles or in conduits. (See "Miscellaneous" Note above for installing or laying conductors, etc.)

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses, for processes within

the class definition, for molding or shaping plastic materials. For forming indefinite length articles by extruding or molding around strand-like or filament-like preforms, see Class 264, subclasses 171.1+. (See note, above, to Coating, Covering And Sheathing.)

294, Handling: Hand and Hoist-Line Implements, especially subclass 19.1 for hand and hoistline implements used in placing pipe and cable.(See "Miscellaneous" Note above for installing or laying conductors, etc.)

324, Electricity: Measuring and Testing, appropriate subclasses for testing of conductors and insulation. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

405, Hydraulic and Earth Engineering, subclass 154.1 for subterranean or submarine pipe or cable laying, retrieving, manipulating, or treating. (See "Miscellaneous" Note above for installing or laying conductors, etc.)

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 113+ for covering by apparatus extruding plastic material about preform within a shaping cavity where the external configuration of the product is diverse from that of the preform. (See note, above, to Coating, Covering And Sheathing.)

427, Coating Processes, subclasses 58+ for processes of coating, per se, wherein an electrical product is produced. (See note, above, to Coating, Covering And Sheathing.)

428, Stock Material or Miscellaneous Articles, appropriate subclasses, for a stock material product, especially subclasses 364+ for a structurally defined or coated rod, strand or filament which is useful as an electrode or as a filament for electric lamps or other discharge devices, and subclasses 411.1+ and 615+ for nonmetallic and metallic composites, respectively, defined in terms of the composition of their components. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

445, Electric Lamp or Space Discharge Component or Device Manufacturing.

493, Manufacturing Container or Tube From Paper; or Other Manufacturing From a Sheet or Web, subclasses 269+ for making a paper tube; and subclasses 405+ for making a folded paper article. (See "Miscellaneous" Note above for apparatus and processes used in the manufacture of electrical conductors, etc.)

48 This subclass is indented under subclass 47. Processes which include flowing a substance to an enclosed cavity which is associated with the conductor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

145, for encapsulating of permanently fluent material in hollow or porous lamina or the filling of the space between laminae subsequent to lamination.

SEE OR SEARCH CLASS:

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, appropriate subclasses for filling receivers.

174, Electricity: Conductors and Insulators, especially subclass 15.1 for electrical cables including means to feed or circulate a fluid therein.

49 This subclass is indented under subclass 47. Processes for joining end-to-end of at least two conductors and/or their coverings.

SEE OR SEARCH THIS CLASS, SUBCLASS:

157+, for processes of joining in an end-to-end relationship of indefinite length lamina not intended to provide a conductive path between its ends.

502+, for apparatus for joining flexible indefinite length bodies end-to-end.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 592.1+, for making of electrical devices, not elsewhere classified.

57, Textiles: Spinning, Twisting, and Twining, subclass 22, 23 and 362 for splicing strands by a twisting or twining operation.

138, Pipes and Tubular Conduits, subclass 97, for processes and apparatus for repairing leaks in pipes and hose, including electric conduits.

140, Wireworking, subclasses 111+, for other processes and devices for joining or uniting wire.

164, Metal Founding, subclasses 91+ for composite article forming by a metal casting operation and particularly subclasses 108+ for processes of uniting two preforms.

174, Electricity: Conductors and Insulators, subclass 21, 22 and 84+ for the structure of conductor joints.

219, Electric Heating, especially subclasses 50+, 78.01, 136+, 148, 603+, 633, and 765+ for bonding by use of electric heat.

228, Metal Fusion Bonding, appropriate subclasses for joining metals by a metallurgical bond as well as joining a metal to a nonmetal and joining two nonmetals by use of a metallic filler to effect a metallurgical bond. Joining a metal to a metal, a metal to a nonmetal or a nonmetal to a nonmetal is to be found in this class if the bond is effected with a nonmetallic cement or by fusion of a nonmetal part.

249, Static Molds, subclasses 83+ for molds for uniting a preform with molding material.

289, Knots and Knot Tying, for mere tying of cords or strands.

50 This subclass is indented under subclass 47. Processes which include the distortion or shaping of the conductor itself.

(1) Note. Twisting, braiding and bending are some examples of the type of conductor manipulations contemplated for this subclass.

51 This subclass is indented under subclass 47. Processes which include the step of applying a material about or over the conductor of indeterminate-length.

(1) Note. Covering materials classified herein include coatings applied as by an extrusion which may function as insulation or for mechanical protection.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 517+ for processes of joining a core to a sheath by a deforming operation, subclass 525 for processes of force fitting a core in a sheath, and subclasses 527.1+ for processes of casting and/or coating a layer on a core followed by subsequent treatment of the cast or coated base.

228, Metal Fusion Bonding, subclasses 126+ for encasing a core with a sheath and bonding the parts together.

427, Coating Processes, subclasses 58+ for coating processes, per se, wherein an electrical product is produced.

428, Stock Material or Miscellaneous Articles, subclasses 615+ for metallic composite defined in terms of the composition of its components.

52 This subclass is indented under subclass 51. Processes in which the cover material is self-sustaining prior to its application to the conductor.

53 This subclass is indented under subclass 52. Processes which involves winding or folding the preformed material about the conductor and/or conductor assembly to cover the conductor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

169+, for processes of winding a filament.

184, for processes of winding a web or sheet.

425+, and 443+, for apparatus for performing winding operations.

54 This subclass is indented under subclass 53. Processes directed to longitudinally bending the sheet material about the conductor.

(1) Note. For a definition of longitudinal bending see the definition of subclass 200 of this class.

SEE OR SEARCH THIS CLASS, SUBCLASS:

200+, for processes of longitudinally bending running or continuous length work.

55 This subclass is indented under subclass 53. Processes in which two or more generally parallel spaced conductors or conductor cables are wrapped or covered.

(1) Note. The conductors herein included may be separated from each other merely by a covering already on one or more of the conductors prior to their being jointly wrapped.

56 This subclass is indented under subclass 53. Processes directed to sequentially applying at least two separate covering materials to the conductor in which at least one covering operation is by wrapping a sheet material about the conductor.

(1) Note. Included within this subclass are processes which involve the enclosing of the conductor with more than one type of cover, e.g., tape and a coating.

57 This subclass is indented under subclass 1. Processes in which a plant or animal or part thereof is bonded to a support to maintain the natural appearance thereof.

(1) Note. The combination of coating a natural plant, flower or biological specimen and then interposing the coated specimen between glass plates is classified herein.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 94.11 for reactive treatment of biological specimens.

47, Plant Husbandry, appropriate subclasses, for processes of treating living plants.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses, particularly subclasses 271.1+ for processes in which a body is embedded in or surrounded by shaping material.

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, appropriate subclasses for disinfecting, deodorizing, preserving, or sterilizing therein provided.

427, Coating Processes, subclasses 4+ for coating processes for coating a plant member or animal specimen.

428, Stock Material or Miscellaneous Articles, subclasses 15+ for an article, in the form of a three-dimensional imitation or treated natural product (e.g., fauna or flora).

58 This subclass is indented under subclass 1. Processes directed to reproducing three dimensional objects by taking photographs of the lineaments of said objects and (1) employing said photographs as guides or templates to mechanically reproduce the objects in three dimensions or (2) assembling said photographs to thus reproduce the objects in three dimensions.

(1) Note. The processes in this subclass generally include the surrounding of the object with cameras which take photographs of the object from the various directions and then using the resultant photographs in proper sequence to reproduce the three dimensional object.

SEE OR SEARCH THIS CLASS, SUBCLASS:

59, for processes of producing relief or intaglio representations of three dimensional objects which do not include the taking of a photograph of the object.

SEE OR SEARCH CLASS:

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses, for processes within the class definition, for shaping plastic materials.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, appropriate subclasses for radiation imagery processes, per se.

59 This subclass is indented under subclass 1. Processes for making reproductions of three dimensional objects, which reproductions simulate the original object in appearance but not in function, and are shaped to approximate the contours of the objects, but not the full depth or front to back dimension.

(1) Note. The articles produced for this subclass are shaped for representation on the facing surface only. Thus the reproduction effect is apparent when the article is viewed from a single plane only.

(2) Note. Where the manufacturing operations are, per se, classified in some other class, the patent is there classified even though the article may be a representation. Thus, for example, Class 264, Plastic and Nonmetallic Article Shaping or Treating: Processes, in appropriate subclasses provides for the shaping or molding of plastic materials to make reproductions, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

58, for processes involving the taking of photographs of three dimensional objects and the employment of said photographs to make reproductions of the objects.

196+, for processes of laminating combined with processes of permanently bending, reshaping or embossing of self-sustaining lamina.

250+, for processes of laminating combined with cutting.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, appropriate subclasses for producing dyed designs on textiles and subclasses 114+ for processes for producing ornamental effects on textile materials there provided for.

29, Metal Working, for miscellaneous processes of mechanical manufacture which may result in the production of a representation. With respect to representation making, the line with Class 29 is as follows: Class 29 takes combined processes including metal working steps where no laminating is recited in the claims. Where adhesive bonding is present the line is that set out between the two classes in section "A. Bonding And/Or Assembly Therefor, " above in the class definition of Class 156.

33, Geometrical Instruments, subclasses 2+ for processes for laying out patterns for apparel making.

40, Card, Picture, or Sign Exhibiting, subclass 616 for relief or intaglio signs.

43, Fishing, Trapping, and Vermin Destroying, subclass 42.53 for processes for making artificial bait.

65, Glass Manufacturing, subclasses 66+ for a process of forming an article from molten glass.

69, Leather Manufactures, appropriate subclasses for processes for finishing cloth to produce ornamental effects and subclasses 21+ for leather working processes there provided for.

82, Turning, subclasses 11+ and 18+ for pattern controlled turning operations.

83, Cutting, appropriate subclasses for cutting operations, per se.

101, Printing, subclass 32 for embossing processes.

125, Stone Working, appropriate subclasses for working stone there provided for.

144, Woodworking, subclasses 329+ for a method of woodworking to produce relief or intaglio representations, particularly subclass 358 for a method of embossing wood.

164, Metal Founding, appropriate subclasses for procuring reproductions by casting metal.

199, Type Casting, appropriate subclasses for type casting.

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, appropriate subclasses especially subclasses 67+ and 120+ for electrolytic methods of producing relief and intaglio surfaces.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses, for processes within the class definitions, for shaping or molding plastic materials, per se, see particularly subclasses 220+.

409, Gear Cutting, Milling, or Planing, appropriate subclasses for a pattern controlled milling, broaching, or planing operation; particularly subclasses 79+ and 289+.

428, Stock Material or Miscellaneous Articles, subclasses 15+ for an article, in the form of a three-dimensional imitation or treated natural product (e.g., fauna or flora).

433, Dentistry, subclass 213 for a wax modeling in dentistry processes.

434, Education and Demonstration, subclasses 81+ for processes for drawing, painting or sculpturing processes in which some aid, or guide is provided for the artisan.

451, Abrading, for an abrading process for producing an ornamental effect.

60 This subclass is indented under subclass 1. Processes involving bonding or joining discrete juxtaposed lamina or spaced juxtaposed areas of a single lamina by adherence or coherence at the interface of the juxtaposed areas.

(1) Note. The adherence is usually accomplished by application of an adhesive composition to one or both parts and the coherence by rendering the one or both parts tacky, usually by solvent, heat, externally applied or the residual heat retained by the part from a previous operation.

(2) Note. The term "adhesive" is that body of material which adheres to each of the parts being secured and which has no structural or functional characteristic other than to facilitate or effect joiner of the parts.

(3) Note. This and the indented subclasses include patents which claim only assembly of parts previously coated with adhesive. See sections "A. Bonding And/Or Assembly Therefor" and "B. Laminating Combined With Other Operations" of the class definition of this class for the lines with other classes.

(4) Note. Processes of adhesively uniting together at least two lamina which (1) do not define by name the adhesive employed and (2) do not define a manipulative procedure of uniting provided for below are classified herein. In this subclass may be found, for example, patents distinguished only by the composition of the particular laminae joined.

SEE OR SEARCH CLASS:

228, Metal Fusion Bonding, appropriate subclasses for joining parts by a metallurgical bond.

61 This subclass is indented under subclass 60. Processes directed to the making of artificial reproductions of naturally occurring objects.

(1) Note. The processes in this subclass are generally related to making artificial reproductions of such naturally occurring objects as animals, plants, flowers, trees, pearls, etc., wherein the reproduction itself is made by a laminating step. Merely making a picture of such object and laminating said picture to a backing is not included in this subclass.

(2) Note. Such items as inflatable toys in the shape of various animals are included in this subclass if a laminating step is involved in the making of said toy.

(3) Note. Operations which are, per se, classifiable in other classes are there provided for even though a reproduction is made of a product of nature. Thus, for example, molding a product of nature from plastic is generally provided for in Class 264, Plastics and Nonmetallic Article Shaping or Treating: Process.

SEE OR SEARCH THIS CLASS, SUBCLASS:

59, for processes for making relief or intaglio representations of three dimensional objects and see especially the notes thereto for the locus of other operations for shaping particular objects.

SEE OR SEARCH CLASS:

428, Stock Material or Miscellaneous Articles, subclasses 15+ for an article, in the form of a three-dimensional imitation or treated natural product (e.g., fauna or flora).

62 This subclass is indented under subclass 60. Processes combined with a step of (1) sketching, designing or diagraming by a hand operation on a material or (2) carving by hand operation figures, letters or devices on a material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

250+, 277 and 278+, for processes of coating or engraving other than by a hand operation.

SEE OR SEARCH CLASS:

83, Cutting, subclass 861 for processes of cutting other than completely through work thickness or through work presented.

427, Coating Processes, subclasses 256+ for nonuniform coating processes, and note especially subclass 260 for utilizing a hand-held brush or absorbent applicator.

434, Education and Demonstration, subclasses 81+ for processes involving drawing, sculpturing or painting there provided for.

62.2 This subclass is indented under subclass 60. Processes which include forming a lamina by assembling individually distinct particulate material from a fluent mass and adhesively bonding the particles to each other and then uniting the lamina thus formed to itself or another lamina.

(1) Note. The distinguishing characteristic of this subclass is that the material used in forming the lamina is handled as a fluent mass as differing from those processes in which each particle is individually handled or positioned.

SEE OR SEARCH THIS CLASS, SUBCLASS:

279+, for processes under subclass 60 combined with the step of mass application of nonadhesive fibers or particles to the surface of a lamina not including the step of forming a self-supporting batt or body.

369+, for apparatus for forming self-sustaining webs or bodies of particulate material.

SEE OR SEARCH CLASS:

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 109+ for processes of forming articles from particulate material when not combined with a subsequent laminating step.

419, Powder Metallurgy Processes, subclasses 61+ for processes for making articles from particulate metal containing materials using pressure only.

62.4 This subclass is indented under subclass 62.2. Processes which include the step of (1) forming the discrete fibers from molten plastic material (2) cutting of filaments to produce fibers approximating in length the staple fibers of natural origin or (3) liberating bonded fibers from a fiber containing material.

(1) Note. Glass is considered a plastic material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

370+, for apparatus for forming self sustaining bodies combined with means to form particles or means to liberate particles.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclasses 376+ for processes of forming fiber or filaments from molten glass; sub-

classes 484+ for glass fiber or filament forming apparatus.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 115+ for formation of particles other than glass combined with a molding operation.

62.6 This subclass is indented under subclass 62.2. Processes which include the step of distorting and portion of the lamina with respect to another portion such that said portions are in contact and bonded together.

62.8 This subclass is indented under subclass 62.2. Processes in which both lamina have been formed by bonding of individually distinct particulate material only.

63 This subclass is indented under subclass 60. Processes directed to bonding by hand operation at least two parts of different colors or shaped to each other or to another part, which bonded parts form an ornamental pattern.

SEE OR SEARCH THIS CLASS, SUBCLASS:

264+, and 297+, for processes of assembling plural discrete lamina to each other or to a single face of an additional lamina.

64 This subclass is indented under subclass 60. Processes combined with the step of sampling, visually, chemically or physically determining some chemical or physical property or characteristic of the lamina a part of a lamina to be joined or of the adhesive employed to bond the laminae together.

(1) Note. The sampling or determination of a property or characteristic of a lamina may be by a visual inspection or by determining the chemical or physical property by chemical test or by some mechanical testing apparatus.

SEE OR SEARCH THIS CLASS, SUBCLASS:

378, for laminating apparatus combined with testing, measuring and indicating means.

SEE OR SEARCH CLASS:

29, Metal Working, subclass 407 for processes which include a step of testing or of indicating combined with a step of mechanical manufacture.

73, Measuring and Testing, for processes of determining physical properties of a lamina to be joined or of the adhesive not combined with assembly and/or joining.

162, Paper Making and Fiber Liberation, subclass 49 and 198 for processes of measuring, testing and/or inspecting combined with a paper making operation.

436, Chemistry: Analytical and Immunological Testing, subclasses 1+ for processes of chemical testing not combined with assembly and/or joining.

65 This subclass is indented under subclass 60. Processes which involve positioning at least two laminae side by side and out of contact with each other and assembling each of the opposed sides which lie in the same plane of laminae to a face of an additional lamina such that the additional laminae are entirely out of facial contact.

SEE OR SEARCH THIS CLASS, SUBCLASS:

265, and 297+, for processes of joining plural discrete laminae to a single face of an additional lamina.

66 This subclass is indented under subclass 60. Processes in which one of the lamina secured to another lamina is a securing device or a device capable of mechanically joining the assembly to another part.

(1) Note. The securing devices include, for example, buttons, hooks and eyes, slide fasteners.

SEE OR SEARCH THIS CLASS, SUBCLASS:

91+, for processes of assembling laminae by mechanical joining means in addition to utilization of an adhesive.

SEE OR SEARCH CLASS:

2, Apparel, subclasses 265+ for methods of attaching buttons or other fasteners to apparel not involving use of an adhesive.

112, Sewing, subclasses 406+ for a web or sheet having a fastener sewn thereto, and subclasses 475.14+ for a method of attaching a fastener to a base by sewing.

428, Stock Material or Miscellaneous Articles, subclasses 99+ for a stock material product resulting from the process of this subclass (66).

67 This subclass is indented under subclass 60. Processes which include the step of applying a phosphorescent, fluorescent and/or luminescent substance to either a lamina and/or adhesive or utilizing at least one lamina and/or adhesive containing such substance.

SEE OR SEARCH CLASS:

250, Radiant Energy, subclasses 483.1+ for devices including fluorescent or phosphorescent material in layer form.

252, Compositions, subclasses 301.16+ - 301.6+ for compositions exhibiting fluorescent or phosphorescent effects.

427, Coating Processes, subclass 157 for processes of coating utilizing a fluorescent or phosphorescent coating material.

68 This subclass is indented under subclass 60. Processes combined with the step of removing the hairy covering or coat from the skin of animals either prior to or subsequent to removal of the skin or pelt from the carcass of the animal.

SEE OR SEARCH CLASS:

19, Textiles: Fiber Preparation, subclass 2 for the freeing of fibers by mechanical means from the skin of animals.

69, Leather Manufactures, subclasses 21+ for processes of treating hides and skins. See (2) Note of subclass 21 for the line between this class (69) and Class 156.

69 This subclass is indented under subclass 60. Processes for bonding a cover to a receptacle.

(1) Note. The receptacle for this subclass is one having utility for containing goods or other material or for shipping purposes.

(2) Note. The processes in this subclass are not combined with a packaging step but relative to the formation of the package. For the combination, see the search notes below.

SEE OR SEARCH CLASS:

53, Package Making, subclasses 476+ for processes of closing a receptacle subsequent to filling thereof with goods or materials or to a filled receptacle.

70 This subclass is indented under subclass 60. Processes which involves assembling a part within or between bonded lamina the outer laminae being bonded in a manner to provide a tolerance of fit between the enclosed part and the outer laminae sufficient to permit changing the position of the enclosed part with respect to the bonded laminae.

(1) Note. The enclosing of a drawstring within the space between bonded laminae is one example within the scope of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

228, for processes of enclosing a spherical part between semi-spherical shells.

300+, for processes of enclosing a plurality of discrete laminae between plural laminae in which the discrete lamina is bonded to one of the plural laminae.

383, for laminating apparatus including means to encase a separate nonadhered part between adhered lamina.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 434+ for processes of retaining clearance for motion between assembled parts.

53, Package Making, subclass 449 and 461 for processes of encasing a wrapper or wrappers about goods or materials.

71 This subclass is indented under subclass 60. Processes in which a lamina is associated with a static building structure.

(1) Note. The lamina in this subclass may be wall paper and the building structure may be a wall of a building to which the wall paper is adhesively united.

SEE OR SEARCH CLASS:
52, Static Structures (e.g., Buildings), subclasses 390+ for a structure having an adhered tile type and subclasses 745.01+ for a process of erection or assembly of a building or building component involving more than merely adhering a preformed sheet form member to a surface.

72 This subclass is indented under subclass 60. Processes which involves bonding a cluster of flexible parts, to a sheetlike lamina by causing each cluster to penetrate within the surface of the bonding medium or lamina to maintain the cluster and sheet in assembled relationship.

(1) Note. Processes of bonding tufts to a backing to form a pile fabric are classified herein.

(2) Note. The flexible parts for this subclass may be hair, feathers, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
63, for processes of manually arranging different colored or shaped discrete elements on to a backing to form a design.
297+, for processes of bonding plural discrete laminae to a single face of an additional lamina.

SEE OR SEARCH CLASS:
28, Textiles: Manufacturing, subclasses 159+ for processes for pile tufting other than by bonding.
300, Brush, Broom, and Mop Making, subclass 21 for processes of making a brush, broom or mop which may include a laminating operation.

73.1 This subclass is indented under subclass 60. Processes which include the step of imparting rapid oscillation at a frequency of greater than 10 cycles per second to at least one of the laminae or adhesive either prior, during or subsequent to formation of the laminate.

(1) Note. The vibration may be effected for the purpose of spreading particulate material, elimination of air pockets in the adhesive, imparting energy to the laminae to cause softening and bonding, etc.

73.2 This subclass is indented under subclass 73.1. Processes wherein at least one lamina has a width and thickness of the same order of magnitude and length considerably greater than the width or thickness.

73.3 This subclass is indented under subclass 73.1. Processes wherein at least one lamina is severed by use of a vibratory force of at least 10 cycles per second.

73.4 This subclass is indented under subclass 73.1. Processes wherein two laminae each having both length and width much greater than thickness are joined along an edge.

(1) Note. The edges of the laminae may overlap providing the area of overlap is small compared to the area of the laminae.

73.5 This subclass is indented under subclass 60. Processes including a step of generating heat to effect bonding by either rapid relative motion of the contacting faces of the laminae or by the rapid relative motion of a separate part contacting the laminae.

SEE OR SEARCH CLASS:
29, Metal Working, subclass 470.3 for processes of welding metal by friction.

73.6 This subclass is indented under subclass 60. Processes including a step of imparting a rapid oscillation or to and fro movement to at least one of the laminae or adhesive at a rate of less than 10 cycles per second either prior to, during or after the formation of a sandwich.

(1) Note. The vibration may be effected for any purpose including the spreading of particulate material, elimination of air pockets in the adhesive, etc.

74 This subclass is indented under subclass 60. Processes which includes the rotation of a workpiece to cause application of centrifugal force to the bonding medium and/or a workpiece which force acts in a direction outwardly of the center of rotation.

(1) Note. The force applied to the lamina may be to effect its separation from a forming surface, to distribute the bonding medium, etc.

SEE OR SEARCH CLASS:

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, particularly subclasses 8+, 114, 270, and 311 for processes within the class definition, which employ centrifugal force in the shaping or molding of ceramic materials.

427, Coating Processes, for processes of coating utilizing centrifugal force.

75 This subclass is indented under subclass 60. Processes including a step of regulating the weight distribution of a product about a pivot point.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 66+ for measuring or testing, per se, to determine the unbalance of a rotating body.

76 This subclass is indented under subclass 60. Processes combined with the step of treating at least one lamina composed of cellulosic material with a reagent either to alter the surface characteristic of the lamina such that it simulates the skin of an animal or alter the normally opaque quality of the lamina such that it has the property of transmitting rays of light.

(1) Note. The reagent may be Zn $C1_2$, H_2SO_4, etc.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclasses 118+ for processes of transparentizing or parchmentizing cellulosic fibers not combined with a liminating procedure.

162, Paper Making and Fiber Liberation, subclass 187, for processes combined with the step of gelatinizing paper.

77 This subclass is indented under subclass 60. Processes including the step of forming pores or other type of open space in situ within a lamina during or subsequent to its formation.

(1) Note. The mechanical formation of pores within a lamina, e.g., perforating, is not within the scope of this and indented subclasses.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclass 20 for a process of foaming of slag, and subclass 22 for a glassworking or treating process including a step of pore forming in situ.

106, Compositions: Coating or Plastic, subclass 122, 601+, and 672+ for processes of making coating or plastic compositions including a step forming pores in situ in the composition.

162, Paper Making and Fiber Liberation, subclass 101 for the step of pore forming combined with a paper making operation.

428, Stock Material or Miscellaneous Articles, subclasses 304.4+ for a composition stock material web or sheet including a porous or cellular component.

501, Compositions: Ceramic, subclass 39 and 80+ for pore-forming ceramic compositions.

521, Synthetic Resins or Natural Rubber, subclasses 50+ for pore-forming, per se, in a synthetic resin composition.

78 This subclass is indented under subclass 77. Processes in which the step of forming the pores is effected by introducing a gas under

pressure to the interior of at least one lamina or by generating a gas in-situ within such lamina.

SEE OR SEARCH CLASS:
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 10+ for foam colloid systems or agents for such systems or making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

79 This subclass is indented under subclass 78. Processes in which the step of foaming occurs after assembling of at least two laminae to form a sandwich.

SEE OR SEARCH CLASS:
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 10+ for foam colloid systems or agents for such systems or making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

80 This subclass is indented under subclass 60. Processes in which the work is chilled to a temperature below that of the normal working temperature of the surrounding atmosphere.

(1) Note. The removal of heat usually effects a change of phase of a constituent part of the lamina and/or adhesive, e.g., solidification of a material which is normally in the liquid state under ambient conditions.

(2) Note. Mere cooling of a previously heated workpiece to cause it to return to normal temperature is not included here, to be classified here the workpiece must be chilled to below normal temperatures.

SEE OR SEARCH THIS CLASS, SUBCLASS:
282, and 311, for other processes involving a cooling step.
498, for laminating apparatus provided with means to cool the work.

SEE OR SEARCH CLASS:
62, Refrigeration, appropriate subclasses for refrigeration processes and apparatus.
162, Paper Making and Fiber Liberation, subclass 54 which includes the step of freezing liquid employed in the fiber liberation or treatment.

81 This subclass is indented under subclass 60. Processes combined with the step of converting a material contained within a hollow imperforate body or lamina to a liquid or gas which is permanently retained within the hollow body in the liquid or gas state.

82 This subclass is indented under subclass 60. Processes which include the step of physically contacting the surface of a lamina with a body of burning gas or vapor, e.g., flame.

SEE OR SEARCH THIS CLASS, SUBCLASS:
497, for laminating apparatus combined with flame contact means for the work.

SEE OR SEARCH CLASS:
8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 140 for processes of singling or carbonizing of textiles.
65, Glass Manufacturing, subclass 120 for a process for flame treating a glass preform; and see the collection of "Search Notes" thereunder.
118, Coating Apparatus, subclass 47 for apparatus for subjecting a surface to a flame.
144, Woodworking, subclasses 329+ for flame treatment of wood.
427, Coating Processes, subclasses 223+ for coating processes including contacting the base or coating with a flame.

83 This subclass is indented under subclass 60. Processes including a step of treating a lamina to cause it to expand or increase in volume.

(1) Note. The swelling may be effected by, for example, absorption of a solvent by the material of the lamina thereby causing expansion thereof. Merely subjecting a lamina to an external force such as a compressive force in one direction to cause it to elongate in another direction is not subject matter for this subclass, nor is subjecting matter for this subclass, nor is subjecting the lamina to tension to cause it to elongate. Inflating a hollow article is also excluded in that the laminae material does not swell.

SEE OR SEARCH THIS CLASS, SUBCLASS:

147, for inflating a hollow core.

156, for fluid pressure used to prevent collapse of a hollow core.

229, for distorting a workpiece by stretching.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 114, 130.1+ and 175 for processes of treating textiles with chemicals, e.g., swelling agents.

162, Paper Making and Fiber Liberation, subclass 187 for processes of hydration or gelatinization combined with a paper making operation.

84 This subclass is indented under subclass 60. Processes combined with the step of treating the material of which the lamina is composed to decrease the volume of the material.

(1) Note. The shrinking of the material of the lamina usually occurs by contacting the material with a liquid agent which is either (1) a constituent of the composition of the material or (2) is from an external source followed by the step of heating of the material containing the liquid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

76, for processes of shrinking a lamina in which parchmentizing or transparentizing also occurs.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclasses 116+ for processes including a shrinking operation.

85 This subclass is indented under subclass 84. Processes in which the step of shrinking of the lamina occurs after associating of at least two lamina.

86 This subclass is indented under subclass 85. Processes in which the step of shrinking a lamina occurs while the lamina is associated with a cylindrical or spherical body.

SEE OR SEARCH THIS CLASS, SUBCLASS:

165, 170, 186, 187+, and 212+, for processes in which one of the laminae has the shape of a cylinder or sphere.

87 This subclass is indented under subclass 60. Processes combined with the step of providing at least one lamina with passageways or channels to discharge gases generated or entrapped at the interface to the atmosphere.

88 This subclass is indented under subclass 60. Processes including a step of selectively bonding strands or fibers at the edges only of a textile material to prevent unraveling or fraying of the strands or fibers.

89.11 With vitrification or firing ceramic material:

This subclass is indented under subclass 60. Processes which include the step or heating a ceramic material of which the lamina and/or coating is composed to a temperature sufficient to vitrify or fire the material.

(1) Note. The firing may be of a decorative vitreous layer subsequent to its application to another lamina in a direct transfer operation to remove the backing sheet, usually by burning

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclasses 33.1+ for processes including the devitrification of glass or the vitrifica-

tion of crystalline glass; subclasses 36+ for methods of bonding glass to glass or glass to metal involving a glass working step.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, particularly subclass 30, 31+, 43, 600+, and 125.

427, Coating Processes, subclasses 331+ for coating processes including post-treatment of a coating and note especially subclass 376.1 for heat fusion of an inorganic coating.

89.12 Forming electrical article or component thereof:
This subclass is indented under subclass 89.11. Subject matter wherein the product formed has disclosed utility as an electrical device or component.

89.13 Elemental carbon containing (e.g., graphite, etc..):
This subclass is indented under subclass 89.12. Subject matter wherein the product formed contains carbon in elemental form; i.e., not in the form of a carbon compound.

89.14 Inorganic titanate compound containing:
This subclass is indented under subclass 89.12. Subject matter wherein the product formed contains an inorganic titanate compound; e.g., solid solutions of titanium dioxide with other metallic oxides, etc.

89.15 Nitride compound containing:
This subclass is indented under subclass 89.12. Subject matter wherein the product formed contains a binary compound of nitrogen; e.g., BN, etc.

89.16 Elemental metal or alloy containing:
This subclass is indented under subclass 89.12. Subject matter wherein the product formed contains free metal or a union of two or more metals.

89.17 Silver containing:
This subclass is indented under subclass 89.16. Subject matter wherein the metal or alloy contains silver (Ag).

89.18 Copper containing:
This subclass is indented under subclass 89.16. Subject matter wherein the metal or alloy contains copper (Cu).

89.19 Tungsten containing:
This subclass is indented under subclass 89.16. Subject matter wherein the metal or alloy contains tungsten (W).

89.21 Molybdenum containing:
This subclass is indented under subclass 89.16. Subject matter wherein the metal or alloy contains molybdenum (Mo).

89.22 Honeycomb-like:
This subclass is indented under subclass 89.11. Subject matter wherein the product formed contains a layer or component including either discrete elements (e.g. tubular constituents) or components which form or cooperate to form cavities the longitudinal axes of which are at an angle to the plane of the web or sheet.

89.23 With wax or wax-like processing aid:
This subclass is indented under subclass 89.11. Subject matter wherein a waxy material of natural or synthetic nature; e.g., ester type wax, hydrocarbon wax, etc. is utilized in processing or formulating the product.

89.24 Coloring agent containing:
This subclass is indented under subclass 89.11. Subject matter wherein the product formed contains a component having tinctorial properties.

89.25 Elemental carbon containing (e.g., graphite, etc..):
This subclass is indented under subclass 89.11. Subject matter wherein the product formed contains carbon in elemental form; i.e., not in the form of a carbon compound.

89.26 Carbon fibers or filaments:
This subclass is indented under subclass 89.25. Subject matter wherein the carbon has a shape such that the length is considerably greater than its width; e.g., whiskers, etc.

89.27 Nitride compound containing:
This subclass is indented under subclass 89.11. Subject matter wherein the product formed contains a binary compound of nitrogen; e.g., BN, etc.

89. 28 Elemental metal or alloy containing:
This subclass is indented under subclass 89.11. Subject matter wherein the product formed contains free metal or a union of two or more metals.

90 This subclass is indented under subclass 60. Processes which includes the step of providing at least one lamina with a material to prevent exudation or flowing of an ingredient from one lamina into contact with another lamina.

(1) Note. The material utilized as the barrier may be a coating, another lamina or an ingredient of one of the lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
289, for processes of utilizing a parting or release material to prevent adhesion of several laminae.
323, for processes of interposing subsequently removed flexible element between lamina and pressure surface.

91 This subclass is indented under subclass 60. Processes combined with the step of mechanically securing of the parts to be joined with a mechanical fastener which constitutes a permanent part of the final product.

SEE OR SEARCH CLASS:
227, Elongated-Member-Driving Apparatus, subclass 14 for apparatus for applying an adhesive coating to workpieces to be assembled as well as a member, e.g., nail.
228, Metal Fusion Bonding, subclasses 135+ for the process of surface bonding at least two parts metallurgically, combined with supplemental mechanical fastening.
428, Stock Material or Miscellaneous Articles, subclass 223 for a plural layer web or sheet with an interlaminar fasteners.

92 This subclass is indented under subclass 91. Processes in which the step of mechanical securing of the parts is by causing elongated or thin elements to penetrate through the parts to maintain them in assembled relationship.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 432+.

93 This subclass is indented under subclass 92. Processes in which the penetrating of the parts to be assembled is by threads or other flexible strands.

SEE OR SEARCH CLASS:
29, Metal Working, subclass 433 for processes of assembling parts by passing a narrow attenuated member through a series of parts and subclass 241 for corresponding apparatus for stringing parts.
112, Sewing, subclasses 475.01+ for processes of assembling parts by stitching operations not combined with the step of laminating.
428, Stock Material or Miscellaneous Articles, subclasses 102+ for a plural layer stock material product involving a combination of sewing and coating or bonding.

94 This subclass is indented under subclass 60. Processes which are (1) combined with the step of recovering material utilized in a previous laminating procedure and/or (2) directed to restoring or rebuilding a damaged or defective article or material by a laminating procedure.

(1) Note. The recovered material may be a constituent used in a laminating procedure, e.g., lamina or constituent of an adhesive or a reject from a previous laminating operation.

(2) Note. The repaired or reclaimed article may have the same or different utility than that processed by the article prior to its reclamation or repair.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 402.01+ for processes of repairing by operations provided for in this class (29).

65, Glass Manufacturing, subclass 28 for a glassworking or treating process which includes the step of reclaiming, renewing, repairing or crack run interruption of glass.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 36.1+ for repairing or restoring articles for use and subclass 30 for furnace lining formation or repair.

427, Coating Processes, subclasses 140+ for processes of restoring or repairing by a coating operation.

429, Chemistry: Electrical Current Producing Apparatus, Product, and Process, subclass 49 for battery with repair feature.

520, Synthetic Resins or Natural Rubbers, appropriate subclasses, particularly Class 523, subclass 166 for a composition containing a synthetic resin or natural rubbers having utility as a puncture sealant for a pneumatic tire or for use in emergency repair of vehicular tires or to processes of preparing said composition.

95 This subclass is indented under subclass 94. Processes in which the article reclaimed, repaired or renewed is of toroidal shape.

(1) Note. See subclass 110.1 of this class (156) for a definition of the scope of the expression "toroidal shape".

SEE OR SEARCH CLASS:

81, Tools, subclasses 15.2+, 15.3 and 15.4 for portable tools used in repairing resilient vehicle tires.

96 This subclass is indented under subclass 95. Processes which are directed to the step of cementing an entirely new tread of camelback upon the worn or damaged surface of a pneumatic tire.

SEE OR SEARCH CLASS:

157, Wheelwright Machines, subclass 13 for processes for treating the outer surface of a tire casing by cutting, lacerating and/or rasping to prepare the surface for retreading.

451, Abrading, for an abrading process performed on a tire casing or for an apparatus for performing an abrading process on a tire casing.

97 This subclass is indented under subclass 95. Processes directed to repairing a tire or tube which has been rendered useless by accidental formation of an opening in the tire or tube.

SEE OR SEARCH THIS CLASS, SUBCLASS:

115, for the step of applying puncture sealing material to the casing of a pneumatic tire.

98 This subclass is indented under subclass 94. Processes combined with the step of removing a marred or imperfect portion of a material prior to repairing.

99 This subclass is indented under subclass 60. Processes which are directed to joining in face to face adhesive contact at least two laminae having a glass composition by adhesive interlayer in which the lamina and interlayer have the property of transmitting rays of light so that bodies can be seen therethrough.

(1) Note. This and indented subclasses is residual to treatments, per se, of laminated glass sandwiches not provided for in this or other classes, e.g., edge sealing, per se, as provided for in subclass 107 of this class (156).

(2) Note. The sandwich is optically transparent through the adhered areas as distinguished from air spaced lamina adhered at the edges only of subclass 109 below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

344, for processes of delaminating glass sandwiches not combined with a laminating procedure.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclasses 36+ for a process of, and subclasses 152+ for apparatus for bonding glass to a preformed part by a glassworking operation; see the "Search Notes" thereunder.

428, Stock Material or Miscellaneous Articles, subclass 38 for a light transmissive mass (which could comprise plural layers) having a frame or opaque border therearound (e.g., stained glass) and subclasses 426+ for a plural layer stock material product including a layer of glass.

100 This subclass is indented under subclass 99. Processes in which the glass lamina and/or interlayer have their surfaces provided with (1) at least two different colors, (2) a single color in a restricted area or (3) a single color varying in intensity or gradation.

(1) Note. Utilization of at least two differently colored glass laminae is within the scope of this subclass.

SEE OR SEARCH CLASS:

162, Paper Making and Fiber Liberation, subclass 134 for processes of treating paper to provide it with a variegated color combined with a paper making procedure.

427, Coating Processes, subclasses 258+ for coating processes including forming superposed diverse nonuniform coatings on a base and note especially subclasses 266 to 269 for utilizing a glass base.

101 This subclass is indented under subclass 99. Processes combined with the step of (1) cutting the glass lamina and/or interlayer; (2) applying stress and/or strain to a glass lamina and/or interlayer to cause its separation thereof into parts; or (3) separating a portion of the interlayer from between the glass lamina.

(1) Note. The expression "cutting" in the definition of this subclass has the same meaning as defined in the class definition of Class 83.

SEE OR SEARCH THIS CLASS, SUBCLASS:

247+, for processes of stripping an adhered lamina. The lamina for the purposes of subclasses 247+ may be a coating or a preform.

250+, for processes of cutting without regard to the composition of the lamina.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclass 56 for a process of bonding glass to a formed part by a glassworking operation combined with a step of cutting, perforating or breaking.

83, Cutting, subclasses 13+ and 861 for processes of cutting not provided for elsewhere; see the search notes.

102 This subclass is indented under subclass 99. Processes combined with the step of mechanically changing the shape, dimension or surface characteristic of the glass lamina and/or interlayer.

(1) Note. Stretching, embossing and roughening of the surface of the glass lamina and/or interlayer are operations within the scope of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

160+, 184+, 196+, and 229, for other deforming processes and the search notes appended thereto.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclasses 54+ for a process of bonding glass to a formed part by a glassworking operation including a step of reshaping a glass preform prior to assembly or subsequent to bonding.

103 This subclass is indented under subclass 99. Processes including the step of applying separate and distinct forces of different magnitude at separate times to a glass sandwich.

SEE OR SEARCH THIS CLASS, SUBCLASS:

312, for processes of applying sequential different pressures without regard to the composition of the lamina.

104 This subclass is indented under subclass 99. Processes including the step of removing air from between the contacting faces of the glass laminae.

(1) Note. The air is removed usually by vacuum treatment and for the purpose of perfecting the bond between the glass lamina and interlayer.

SEE OR SEARCH THIS CLASS, SUBCLASS:
286, for similar processes without regard to composition of the lamina.
382, for laminating apparatus including means for enclosing work in an evacuated chamber.

SEE OR SEARCH CLASS:
65, Glass Manufacturing, subclass 34 for a process of glassworking which includes the step of sealing off of a gas evacuating opening, and subclass 270 for glassworking apparatus including means for glass envelope tipping off with or without exhausting means.

105 This subclass is indented under subclass 99. Processes including the step of applying an external force to the exterior faces of a glass sandwich by applying a fluid thereto under pressure.

(1) Note. The fluid may be liquid or gaseous, which, if the latter, must be greater than atmospheric.

SEE OR SEARCH THIS CLASS, SUBCLASS:
285, for processes of applying fluid under pressure during a laminating operation.
382, for laminating apparatus including means to apply fluid pressure to the work.

106 This subclass is indented under subclass 99. Processes in which the adhesive interlayer used to bond the glass lamina is a self-supporting film prior to association with the lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
306+, for processes of autogenous bonding and/or utilizing preformed bonding agent.

107 This subclass is indented under subclass 99. Processes which are directed to filling a groove around the edges and between a pair of glass laminae with a calking or sealing material.

(1) Note. Calking or sealing operations, per se, are classified herein even though not combined with step of assembly.

SEE OR SEARCH THIS CLASS, SUBCLASS:
48, for processes of sealing electrical conductors.

SEE OR SEARCH CLASS:
114, Ships, subclass 86 for methods of filling or closing seams between planks.
425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclass 123 for composite product making by means supporting plural preforms in spaced relation in a molding cavity.

108 This subclass is indented under subclass 60. Processes in which a lamina having the property of transmitting rays of light is secured over an aperture in a separate lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
252, for processes of laminating including the step of forming an opening in a lamina.

109 This subclass is indented under subclass 60. Processes which are directed to bonding at least two transparent members while maintained in spaced relationship to each other.

(1) Note. The product produced by the processes herein is usually a window which has an evacuated space between the transparent members.

SEE OR SEARCH THIS CLASS, SUBCLASS:
292, for processes of bonding of laminae having opposed facing areas out of contact.

SEE OR SEARCH CLASS:
65, Glass Manufacturing, subclass 58 for a process of bonding glass to a formed

part by a glassworking operation in which the parts have opposed facing areas out of contact.

228, Metal Fusion Bonding, subclass 121 for the process of bonding nonmetals (e.g., glass panes) with molten metal cement.

428, Stock Material or Miscellaneous Articles, subclass 34 for a product in the form of plural, air-spaced layers of transparent or translucent materials sealed at their edges.

110.1 Making flexible or resilient toroidal shape; e.g., tire, inner tube, etc.:

This subclass is indented under subclass 60. Process for the manufacture of resilient or flexible ring-like body which body is uniquely adapted to be resilient without distortion from its general toroidal shape.

(1) Note. The majority of the art in this subclass relates to processes for making vehicle tires and innertubes, but the subclasses are not so limited. The manufacture of other similar structures by adhesive bonding, e.g., an "O-ring" gasket, may be found here if toroidal in shape and resilient.

(2) Note. As a corollary to the above, a process for adhering rubber or rubber-like materials, where achieving a toroidal shape plays no part in the process, is excluded from this and indented subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

64, for a tire-making process which involves testing, measuring or inspecting.

95+, for a process for repairing an object which has a toroidal shape.

136, for tire bead-ring making by a process of this class.

307.1, for a method of adhering together rubber materials through vulcanization, where the method is not restricted to materials having a toroidal shape.

394+, for tire building apparatus.

SEE OR SEARCH CLASS:

26, Textiles: Cloth Finishing, appropriate subclasses especially subclass 54 and 63 for methods of stretching endless bands for use in tires when not claimed in combination with an assembly step.

28, Textiles: Manufacturing, subclasses 165+ for treatment, e.g., shrinking, of a thread-interlaced article of fabric.

29, Metal Working, subclass 22 for a tire upsetting, cutting, punching, etc., process or apparatus; subclass 159.1 for a tire manufacturing process which does not include a step of adhesive bonding, molding, vulcanizing, etc. and subclass 426.1 for a disassembly process.

73, Measuring and Testing, subclasses 863+ for a method of preparing a sample of a tire component for a test.

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, appropriate subclasses, for filling tires with a liquid which does not undergo a chemical reaction or a change in physical state.

152, Resilient Tires and Wheels, appropriate subclasses for resilient tires and see especially the notes in the class definition of that class (152) for the locus of other art relating to tire structures and production.

260, Chemistry of Carbon Compounds, subclasses 709+ for a rubber composition.

264, Plastic and Nonmetallic Article shaping or Treating: Processes, for making tires by molding when no adhesive bonding of self-sustaining laminae is involved. See particularly subclasses 501+, for tire making by direct pressure application, subclass 45.1 composite article making employing a porous component and subclasses 267+ for composite article making against the inner surface of a hollow body. Subclasses 315 and 326 therein are pertinent to employing toroidal mold bags and producing toroidal bodies, respectively.

111 This subclass is indented under subclass 110.1. Processes in which the toroidal shape travels to discrete work stations and different operations are performed at each station.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 429+ for other assembly processes in which the work is moved progressively to separate assembly stations.

112 This subclass is indented under subclass 110.1. Processes in which the resiliency of the toroidal shape is produced either by the resiliency of the material used, or the material used has entrapped gas therein, which gas is at atmospheric pressure or less when the shape is not under load.

SEE OR SEARCH THIS CLASS, SUBCLASS:
404, and see the notes thereto for apparatus for making solid tires.

113 This subclass is indented under subclass 112. Processes in which the resilient material has apertures or enclosed cavities therein to increase the cushioning effect of the toroid.

(1) Note. The articles manufactured by these processes have no means for retaining fluids under compression. A disclosure that the article is a pneumatic pressure container is sufficient to keep it from this subclass.

114 This subclass is indented under subclass 110. Processes including the incorporation of a solid material other than rubber at least a portion of the material lying on the external surface of the toroidal shape.

(1) Note. In this subclass may be found, for example, the incorporation of anti-skid materials such as textile fibers, metal springs or particles, abrasive granular material, etc., to the tread surface of the tire.

SEE OR SEARCH THIS CLASS, SUBCLASS:
96, for adhesively securing retreads in the repairing processes.

SEE OR SEARCH CLASS:
152, Resilient Tires and Wheels, subclasses 167+ and 208+ for resilient tires provided with antiskid elements embedded therein.
157, Wheelwright Machines, subclass 13 for processes for treating the outer surface of a tire by cutting or rasping to produce a nonskid surface.
451, Abrading, for a process for treating the outer surface of a tire by an abrading operation.

115 This subclass is indented under subclass 110.1. Processes including the step of affixing a material capable of filling or closing apertures occurring during use of the torodial article.

SEE OR SEARCH THIS CLASS, SUBCLASS:
97, for processes for repairing tire punctures by a laminating operation.

SEE OR SEARCH CLASS:
81, Tools, subclasses 15.5+ for portable puncture repair tools.
141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclass 5 for processes for filling tires or tubes with nongaseous fluent material such as puncture sealants.
152, Resilient Tires and Wheels, subclasses 502+ for tires provided with puncture sealing structures.
252, Compositions, subclass 72 for compositions with leak-stopping agents.

116 This subclass is indented under subclass 110.1. Processes including a step of applying a material differing in color from the main toroid body to a portion only of the toroid, which portion is located on the exterior side walls thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
90, for the utilization of a barrier layer to prevent migration or bleeding of materials between layers.

117 This subclass is indented under subclass 110.1. Processes in which the toroid is formed by directly applying to the building form the material of the carcass while in the form of cords, strands or tapes.

(1) Note. Conventionally the cord structure of tire bodies are applied to the drum in the form of webs. In the instant patents the cords have not been assembled or woven into webs before application, rather they are applied while still in the form of strands.

SEE OR SEARCH THIS CLASS, SUBCLASS:
397, for apparatus for building tires from strands or narrow tapes.

118 This subclass is indented under subclass 110.1. Processes for making toroidal shapes which are structurally airtight and are uniquely adapted to hold fluids under pressure.

(1) Note. The articles produced by this process must be, per se, airtight, as for example, a tube for a tire. So called "tubeless" tires which require the wheel to be airtight are not considered to be subject matter for this subclass.

SEE OR SEARCH CLASS:
152, Resilient Tires and Wheels, subclasses 510+ for pneumatic tube structures.
264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses, particularly subclass 315 and 326 pertaining to employing toroidal mold bags and producing toroidal bodies, respectively.

119 This subclass is indented under subclass 118. Processes in which the airtight tube has more than one airtight compartment whereby loss of pressure in a single compartment would not affect pressure in the other compartments.

SEE OR SEARCH CLASS:
152, Resilient Tires and Wheels, subclasses 331.1+ for multiple chamber tube constructions.

120 This subclass is indented under subclass 118. Processes including a step of applying the fitting whereby the pressure fluid is introduced into the airtight tube.

SEE OR SEARCH CLASS:
152, Resilient Tires and Wheels, subclasses 429+ for valved tires or tubes.

121 This subclass is indented under subclass 118. Processes including a step of applying a layer of material to the outer peripheral surface of the formed tube, which material increases the stress resistance of the tube.

122 This subclass is indented under subclass 118. Processes which include a step of securing the tube ends to each other to form a closed torus.

SEE OR SEARCH THIS CLASS, SUBCLASS:
49, for processes for splicing indefinite length conductors.
157, for processes for splicing indefinite length laminae end-to-end.
217, for processes for bending a one piece blank and joining the edges to form an article.

123 This subclass is indented under subclass 110.1. Processes in which the toroidal shape is built up of at least two layers or strata of material, which layers are adhesively secured together.

124 This subclass is indented under subclass 123. Processes in which at least one of the layers or a component of one of the layers includes metal in the form of strands or filaments.

125 This subclass is indented under subclass 123. Processes including a step of forming the outer layer of the toroid by introducing the material of the layer into a closed mold while under pressure in a fluent state.

SEE OR SEARCH THIS CLASS, SUBCLASS:
242+, for other laminating processes including a step of lamina formation by molding or casting.

SEE OR SEARCH CLASS:

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, 328.1-328.19 particularly subclasses for injection type of molding processes. subclasses 241+ therein pertain to composite, finite article making and subclasses 315 and 326 pertaining to employing toroidal mold bags and producing toroidal products, respectively.

126 This subclass is indented under subclass 123. Processes including a step of telescoping performed ring-like layers of material onto a shaping form.

SEE OR SEARCH THIS CLASS, SUBCLASS:

293, for laminating processes including the step of inserting a lamina in a hole, aperture or recess and adhering it to the walls thereof.

127 This subclass is indented under subclass 126. Processes in which the outer band constitutes the tread portion of a tire and have the tread configuration before assembly.

128.1 Applying tread material to fully-formed carcass:

This subclass is indented under subclass 123. Processes including a step of applying the tire tread layer of material onto the outer peripheral surface of the formed toroidal tire body.

SEE OR SEARCH THIS CLASS, SUBCLASS:

92, for the application of adhesively-bonded tread material to a used tire.

128.6 With specified treatment of tread material before application to carcass:

This subclass is indented under subclass 128.1. Process in which the material of which the tread is made is treated, as by coating, etc., before application of the tread material to the tire carcass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

127, for telescoping a preformed tread band onto a tire carcass.

129 This subclass is indented under subclass 128.1. Processes in which the tread surface configuration has been shaped before application of the tread material to the tire carcass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

127, for telescoping a preformed tread band onto a tire carcass.

130 This subclass is indented under subclass 128.1. Processes in which the tread material is applied by bending progressively around the formed carcass or in which a lamina having no stretch characteristics is applied to the carcass under the tread material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

184+, for laminating processes generally for winding a lamina about a core.

130.3 With specified procedure for interlocking of laminae or removal of air from therebetween; e.g., "stitching", etc.:

This subclass is indented under subclass 128.1. Process wherein a specific procedure is claimed for achieving an irregular interface between laminae or for removing voids from between laminae.

130.5 With specified procedure for cooling or heating; e.g., for vulcanization, etc.:

This subclass is indented under subclass 128.1. Process including a step of heating or cooling the workpiece in which the conditions for such treatment are specifically claimed.

(1) Note. The conditions must include more than mere nominal "vulcanization".

130.7 With specified procedure for bead, carcass or sidewall formation:

This subclass is indented under subclass 128.1. Process including a step of bead, carcass of sidewall formation in which one of more specific details of such procedure is claimed.

(1) Note. The application of the tread in these patents usually is nominal; where tread application is more than nominal, the patent should be cross-referenced to subclass 128.1.

(2) Note. Patents are not cross-referenced to this subclass on the basis of nominal recitation of tread application, but rather cross-referenced to those subclasses below which are directed more specifically to the details of manufacture recited in the patent.

SEE OR SEARCH THIS CLASS, SUBCLASS:
131+, for bead-applying processes.
133+, for carcass and sidewall building processes.

131 This subclass is indented under subclass 123. Processes including a step of applying wire reinforcing rings defining the inner peripheral edges of the tire.

SEE OR SEARCH THIS CLASS, SUBCLASS:
136, for processes for making tire bead rings, per se.
403, for apparatus for positioning tire bead rings on the peripheral surface of the tire carcass.

132 This subclass is indented under subclass 131. Processes including a step of wrapping the substance of the tire carcass about the wire bead ring to secure it in position.

SEE OR SEARCH THIS CLASS, SUBCLASS:
400+, for apparatus for folding the tire carcass fabric material about the bead reinforcements.

133 This subclass is indented under subclass 123. Processes including a step of bending the material of the tire body around and into the configuration of the forming surface on which it is shaped.

134 This subclass is indented under subclass 133. Processes including the formation of the butt end joint or splice or some manner of direct treatment peculiar to the spliced or butt end area.

135 This subclass is indented under subclass 110.1. Processes limited to or uniquely adapted to the treatment of that portion of the tire sidewall at or adjacent the ring reinforced inner periphery.

136 This subclass is indented under subclass 60. Processes for making ring-like articles, which articles are particularly adapted for use as reinforcement for the inner edges of pneumatic tire casings.

SEE OR SEARCH THIS CLASS, SUBCLASS:
131, for tire building processes including a step of applying the bead ring.
157+, for splicing indefinite length lamina end to end.
217+, for bending a one piece blank and joining the edges to form an article.
422, for apparatus for winding wire lengths to form the tire bead reinforcement structures.
460, for apparatus for folding flexible fabrics about tire bead structures to cover same.

137 This subclass is indented under subclass 60. Processes directed to making of flexible endless power transmission belts.

(1) Note. Processes of making endless conveyor belts are excluded from this and indented subclasses unless the patent discloses that the belt also has utility as a power transmission belt. Appropriate manipulative subclasses below should be searched for the manufacture of other endless belts.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 525.1+, for processes of mechanically uniting ends of a continuous element to produce an endless member which may be utilized as a drive belt.
428, Stock Material or Miscellaneous Articles, appropriate subclasses, for a plural layer stock material product not elsewhere provided for.
474, Endless Belt Power Transmission Systems or Components, particularly subclasses 237+ for structure of a friction drive belt.

138 This subclass is indented under subclass 137. Processes which include the step of providing the surface of the endless belt, which contacts the means to be driven, with channels, recesses or corrugations.

SEE OR SEARCH THIS CLASS, SUBCLASS:
257, and 268, for laminating processes combined with the step of cutting a groove in a lamina or laminated article.
510+, for laminating apparatus combined with cutting means.

SEE OR SEARCH CLASS:
83, Cutting, subclass 13 for processes of cutting a groove in a material.

139 This subclass is indented under subclass 137. Processes which are directed to producing drive belts of V or trapezoid cross-section.

140 This subclass is indented under subclass 139. Processes combined with the step of shaping an uncured or unvulcanized material to a V or trapezoid configuration by causing the material to flow to the configuration of a forming surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:
196+, for processes of reshaping of a self-sustaining lamina.
242+, for processes of forming a lamina by molding or casting from a molten material.

141 This subclass is indented under subclass 140. Processes combined with the step of covering of at least one lamina prior to altering the shape of the assembly to a V or trapezoid configuration.

SEE OR SEARCH THIS CLASS, SUBCLASS:
212+, for processes of bending a sheet to conform to the shape of a configured lamina while in contact therewith.

142 This subclass is indented under subclass 139. Processes combined with the step of removing material by cutting of an assembly of laminae to a V or trapeziod shape.

(1) Note. The patents in this subclass mostly involve transverse cutting of an endless body along the width thereof to form a plurality of V-belts.

SEE OR SEARCH THIS CLASS, SUBCLASS:
193, for processes of cutting a wound body.

143 This subclass is indented under subclass 60. Processes directed to making of flexible hollow conduits or hose and reinforcing the conduit or hose with either by a helical wire or by plural rings.

(1) Note. The helical wire may be applied as a preformed coil (144) or may be wound with or around the tube during winding thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
169+, for processes of winding a filamentary material to form a helical coil.
184, for processes of winding of a sheet or web to form a hollow tube.
433+, for laminating apparatus including means to form a helical wire.
443+, for means to wind a sheet or web to form a hollow tube.

144 This subclass is indented under subclass 143. Processes in which the helical coil or plural rings utilized as the reinforcing means is in the form of a coil or rings prior to assembly with the material forming the tube or conduit.

145 This subclass is indented under subclass 60. Processes combined with the step of enclosing a filling of the space in the interior of a hollow or porous lamina or the space between spaced adhered lamina with a gas, vapor or liquid which remains permanently associated with the lamina.

(1) Note. Patents in this subclass include inflating a hollow lamina subsequent to its assembly with another lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:

81, for processes of gasification or a liquid in situ within a hollow body.

156, for processes of utilizing fluid pressure to prevent collapse of hollow structure during assembly and/or joining.

285, for processes of using fluid pressure in general.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 1 for process of gas or vapor dispensing.

146 This subclass is indented under subclass 145. Processes in which the filling step takes place prior to bonding.

147 This subclass is indented under subclass 146. Processes in which the filling operation is of an impervious hollow core.

(1) Note. The filling may be, for example, inflation with air of a football bladder.

148 This subclass is indented under subclass 60. Processes combined with the step of weaving, knitting, braiding and/or needling.

(1) Note. For the scope of the textile working operations provided for in this subclass, see the appropriate textile working classes, e.g., weaving, see Class 139, Textiles: Weaving, and for knitting, see Class 66, Textiles: Knitting.

SEE OR SEARCH THIS CLASS, SUBCLASS:

91, for processes of adhesively uniting at least two laminae combined with the step of additionally securing them together by a sewing operation.

393, for laminating apparatus combined with braiding or weaving means.

SEE OR SEARCH CLASS:

28, Textiles: Manufacturing, subclasses 107+ for processes of and apparatus for producing fabrics either by punching fibers through a base fabric or through a batt of fibers.

57, Textiles: Spinning, Twisting, and Twining, subclass 362 for processes for twisting filamentary and/or fibrous material into yarns, threads, cords, etc.

66, Textiles: Knitting, appropriate subclasses, for processes and apparatus for knitting textiles.

87, Textiles: Braiding, Netting, and Lace Making, subclasses 8+ for processes of braiding of strands together.

139, Textiles: Weaving, appropriate subclasses, for processes of weaving strands to produce textiles.

140, Wireworking, subclass 149 for processes of twisting wire.

149 This subclass is indented under subclass 148. Processes in which the textile working operation occurs about a conduit or tube having an open passageway therethrough.

SEE OR SEARCH CLASS:

87, Textiles: Braiding, Netting, and Lace Making, subclass 9 for processes of braiding to produce a tubular fabric.

150 This subclass is indented under subclass 60. Processes combined with the step of forming or depositing a coating material upon a base by electrolytic action, electrophoresis or electroosmosis, and/or cathode sputtering.

SEE OR SEARCH THIS CLASS, SUBCLASS:

536, for laminating apparatus including means to apply a coating other than the laminating adhesive.

SEE OR SEARCH CLASS:

204, Chemistry: Electrical and Wave Energy, subclasses 471+ for electrophoretic or electro-osmotic coating or forming of an object and subclasses 192.12+ for glow discharge sputter deposition (e.g., cathode sputtering, etc.).

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclasses 80+ for processes of coating by electrolytic action.

151 This subclass is indented under subclass 150. Processes directed to electrodepositing a coating on the face of a first lamina which contacts the face of second lamina prior to its contact with the second lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:

314+, for processes of applying a coating to an adherent face of one lamina by a coating operation not involving electrodeposition.

152 This subclass is indented under subclass 60. Processes which includes the step of separating one lamina from another lamina or from an assembly of laminae, and thereafter bonding the separated lamina to the same lamina from which it was previously separated.

(1) Note. The laminae need not be initially bonded. For example, in this subclass may be found patents in which associated laminae are separated, adhesive is applied and the laminae and reunited and bonded.

SEE OR SEARCH THIS CLASS, SUBCLASS:

247+, for processes of stripping an adhered lamina combined with a laminating step.

344, for the step of delaminating, per se.

SEE OR SEARCH CLASS:

29, Metal Working, subclass 426.1 for processes which include the step of disassociating one or more parts.

153 This subclass is indented under subclass 60. Processes combined with the step of removing of an integral portion of a material by a grinding action.

SEE OR SEARCH CLASS:

29, Metal Working, subclass 89.5 and 90.01+ for processes of wearing-in or burnishing metal.

65, Glass Manufacturing, subclass 61 for process of glassworking and/or treating combined with the step of grinding; see the "Search Notes" thereunder.

451, Abrading, subclasses 28+ for an abrading process which is not combined with a laminating operation.

154 This subclass is indented under subclass 153. Processes in which the abrading or grinding step takes place after combining the laminae.

(1) Note. Abrading or grinding of a lamina while associated but not adhesively bonded thereto is classified herein.

155 This subclass is indented under subclass 60. Processes combined with the steps of provisionally associating a part with a 204, Chemistry: Electrical and Wave Energy, subclasses 471+ for electrophoretic or electro-osmotic coating or forming of an object and subclasses 192.12+ for glow discharge sputter deposition (e.g., cathode sputtering, etc.) separate solid part or material, performing a laminating operation, and subsequently destroying the separate solid part or material.

(1) Note. The destruction may be accomplished by dissolving, melting or breaking the part into smaller constituents which can be easily removed, e.g., breaking a core into small grains.

SEE OR SEARCH THIS CLASS, SUBCLASS:

153+, for processes of destroying a transitory material by abrading or grinding.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 114.6 for processes of swelling textiles which includes the step of destruction of a portion of the textile.

29, Metal Working, subclasses 423+ for processes which include destroying separate material which has been temporarily associated to another part.

65, Glass Manufacturing, subclass 23 for a process of glassworking combined with a step of destroying or delami-

nating a transitorily attached or associated layer.

156 This subclass is indented under subclass 60. Processes combined with the step of filling the space of a hollow lamina or of the space between spaced lamina with a temporary gaseous or liquid material which exerts an opposing force during assembly and/or joining to prevent a change in the configuration or shape of one of the lamina or of the assembled laminae.

SEE OR SEARCH CLASS:

72, Metal Deforming, subclass 54 for cores filled with fillers, such as sand, liquid, etc., which are put into the tubes to support the walls during the bending operation.

157 This subclass is indented under subclass 60. Processes directed to the step of associating the ends only of two laminae of indeterminate length to increase the overall length thereof.

(1) Note. The splice may be either a butt or overlap joint.

SEE OR SEARCH THIS CLASS, SUBCLASS:

304.1+, for processes of bonding laminae end-to-end without overlap.

158 This subclass is indented under subclass 157. Processes which are directed to splicing of laminae having a cross-section the dimensions of which are generally the same.

SEE OR SEARCH THIS CLASS, SUBCLASS:

49, for methods of splicing electrical conductors of indefinite length.

SEE OR SEARCH CLASS:

57, Textiles: Spinning, Twisting, and Twining, subclass 362 for processes of splicing strands by a twisting or twining operation.

140, Wireworking, subclasses 111+ for processes of joining or uniting wires not involving an adhesive uniting operation.

242, Winding, Tensioning, or Guiding, subclasses 475.1+ for means to unite a reserve thread to the last end of a thread on a winding bobbin in a winding machine.

289, Knots and Knot Tying, subclass 1.5 for processes of intertwining portions of cords, ropes or strips without unlaying the strands for the purpose of fastening them together.

159 This subclass is indented under subclass 157. Processes combined with the step of cutting the ends of the laminae to be joined.

(1) Note. The cutting in this subclass is usually to have the abutting ends of the laminae mirror images of each other or to prepare the ends for bonding.

(2) Note. The scope of the term “cutting” is determined by the definition of Class 83.

SEE OR SEARCH THIS CLASS, SUBCLASS:

250+, particularly subclass 258 for processes of cutting to shape the joining edge surfaces only of at least one lamina prior to assembly in which at least one lamina is not of indefinite length.

160 This subclass is indented under subclass 60. Processes which includes the step of applying an external force within the elastic limit of the material to at least one lamina prior to bonding to cause a change of form or dimension of the lamina and maintaining the lamina under such application of force during the bonding operation.

(1) Note. Merely holding a lamina taut during laminating operation is not considered an application of stress for this subclass.

(2) Note. Stretching of a fabric not to place the individual strands or filaments under stress but to cause the individual weft and waft strands or filaments to come closer to one another is not considered an application of stress for this subclass.

(3) Note. The external force may be one of tension or compression of the lamina. One form of tension is stretching.

SEE OR SEARCH THIS CLASS, SUBCLASS:
84, for processes of shrinking of the material of a lamina.
229, for processes of stretching wherein the lamina is not under a stress or strain during the bonding operation.
494+, for laminating apparatus including means to apply tension or to stretch the work.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 446+ for processes of assembling parts to each other in which one of the parts is under stress during assembly.

161 This subclass is indented under subclass 160. Processes which are directed to application of the external force to slender thread-like laminae.

SEE OR SEARCH THIS CLASS, SUBCLASS:
166+, for processes of bonding flexible filamentary material while in indefinite length or running length.
296, for processes of bonding definite length elongated filaments.

SEE OR SEARCH CLASS:
29, Metal Working, appropriate subclasses for processes involving prestressing of filamentary material.

162 This subclass is indented under subclass 160. Processes in which the application of external force to the lamina occurs during winding thereof.

(1) Note. See subclass 184 of this class for a definition of the term "winding".

SEE OR SEARCH THIS CLASS, SUBCLASS:
184+, for processes of bonding laminae combined with the step of winding a sheet or web.

163 This subclass is indented under subclass 160. Processes in which the lamina to which the external force is applied is in the form of sheet or web and the stressed sheet or web is bonded to another sheet or web.

(1) Note. A sheet or web is for the purposes of this class very thin in relation to its length and breadth; as a sheet of glass or paper.

164 This subclass is indented under subclass 163. Processes in which the web subjected to an external force is moving during such application.

165 This subclass is indented under subclass 160. Processes in which the lamina subjected to an external stress is a spherical or hollow tubular body.

SEE OR SEARCH THIS CLASS, SUBCLASS:
170, 186, 187+, and 212+, for bonding processes in which one of the laminae is of spherical or tubular shape.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 450+ for processes of uniting mating parts in which one of the parts is prestressed.

166 This subclass is indented under subclass 60. Processes directed to the step of (1) assembling at least one flexible thread-like lamina with a similarly or differently shaped lamina while the thread-like lamina is of indeterminate length during the assembly operation or (2) causing a single thread-like lamina to be bonded to itself.

(1) Note. Flexible rods of indefinite length are considered filamentary material for the purposes of this and indented subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:
161, for processes of bonding filaments in stressed condition.
296, for processes of bonding filaments of finite length and are not considered staple fibers.

433+, for apparatus for laminating an indefinite or indefinite length flexible strand, rod, tube or filament.

167 This subclass is indented under subclass 166. Processes combined with the step of continuously generating the continuous filaments or threads.

(1) Note. The filaments herein may be formed by an extruding operation, for example.

SEE OR SEARCH THIS CLASS, SUBCLASS:

28, for processes of forming filaments from a molten plastic material combined with a cutting step to form staple fibers.

500, for laminating apparatus combined with casting, molding or extruding means.

SEE OR SEARCH CLASS:

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 165+ for processes within the class definition, for forming continuous or indefinite length articles from plastic materials.

168 This subclass is indented under subclass 166. Processes combined with the step of removing an adhesively secured filamentary material from another material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

153+, for processes of removing an adhesively secured lamina by the step of abrading or grinding.

155, for processes of removing an adhesively secured lamina from another lamina by destruction thereof.

247+, for processes of stripping nonfilamemtary material previously adhesively adhered to another lamina.

344+, for delaminating processes, per se.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 426.1+ for processes of disassembly.

169 This subclass is indented under subclass 166. Processes combined with the step of bending the filamentary material in a substantially circular path with overlap more than enough to merely join the ends.

SEE OR SEARCH THIS CLASS, SUBCLASS:

143, for processes of making helical wire reinforced flexible tubes which includes the step of winding a filament to form the helical wire.

161, for processes of winding a filament in which the filament is under stress during the winding operation.

184+, for processes of winding a sheet or web.

SEE OR SEARCH CLASS:

242, Winding, Tensioning, or Guiding, subclasses 430+ and 470+ for a strand article or storage package winding machine.

170 This subclass is indented under subclass 169. Processes which involves the step of winding of a filament about a globular or spherical body or lamina.

SEE OR SEARCH CLASS:

242, Winding, Tensioning, or Guiding, subclasses 435+ and 436 for winding elongated material about a spherical core without specified adhesive bonding.

171 This subclass is indented under subclass 169. Processes including a step of winding a sheet or web about the wound filament or about the core on which the filament is wound.

SEE OR SEARCH THIS CLASS, SUBCLASS:

162, for processes of prestressing a sheet or web during winding thereof.

184+, for processes of winding a web or sheet.

172 This subclass is indented under subclass 169. Processes directed to winding the filament about a core not fabricated by a winding operation and bonding the filament to the core.

(1) Note. The core may be for the purposes of this subclass of any configuration, for example, a sheet or tube.

173 This subclass is indented under subclass 169. Processes directed to winding the filament about a core or mandrel to support the filament during the winding operation without adhesively bonding the filament to the core or mandrel.

SEE OR SEARCH THIS CLASS, SUBCLASS:

172, for processes of winding a filament about a core to which the filament is ultimately adhesively secured.

174 This subclass is indented under subclass 173. Processes combined with the step of cutting of the wound assembly parallel to the longitudinal axis of the core or mandrel and opening the cut body.

(1) Note. The patents in this subclass usually relate to the fabrication of weftless fabrics.

175 This subclass is indented under subclass 173. Processes directed to the making of a product constituted solely of filamentary material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

174, for similar processes of bonding filamentary material only combined with a cutting step.

180+, for processes of assembly of filaments only not combined with a winding operation.

176 This subclass is indented under subclass 166. Processes which are directed to bonding of at least one filamentary material to a web of indeterminate length.

SEE OR SEARCH THIS CLASS, SUBCLASS:

436, for laminating apparatus for bonding at least one strand or filament to an indefinite or running length web.

177 This subclass is indented under subclass 176. Processes directed to bonding at least one filamentary material to a web while at least a portion of the filamentary material is disposed crosswise of the length of the web to which it is secured.

SEE OR SEARCH THIS CLASS, SUBCLASS:

439, for apparatus for laminating a strand crosswise of a web.

178 This subclass is indented under subclass 176. Processes directed to the step of bonding at least two filaments to a web of indefinite length.

SEE OR SEARCH THIS CLASS, SUBCLASS:

297+, for processes of bonding plural filaments of finite length to a sheet or web.

179 This subclass is indented under subclass 176. Processes directed to interposing at least two filaments between at least two webs of indeterminate length and in which the filaments are in contact with the plural webs.

(1) Note. The patents in this subclass usually relate to making reinforced paper.

180 This subclass is indented under subclass 166. Processes in which only filaments of indefinite or running length are united to form an article.

(1) Note. The products formed by the processes of this subclass may be strands, rods or cords.

SEE OR SEARCH THIS CLASS, SUBCLASS:

441, for laminating apparatus including means to gather strands or filaments only into an indefinite length rod, strand or web.

181 This subclass is indented under subclass 180. Processes in which the article made is a sheet or web.

182 This subclass is indented under subclass 60. Processes in which two or more intermediate laminates are assembled into a final laminate, usually of four or more layers.

(1) Note. The claims may include the step or steps of making an intermediate laminate by adhesive bonding, coating, etc..

(2) Note. The step of assembling a sandwich to a nonlaminated product or single element is not considered assembly of subassemblies for this subclass.

SEE OR SEARCH CLASS:
29, Metal Working, subclass 469 for processes of joining subassemblies there provided for.

183 This subclass is indented under subclass 60. Processes combined with the step of imparting to at least one lamina a crinkle or wrinkle effect, known as crepe, by the step of crowding a web or sheet back on itself to induce it to wrinkle.

(1) Note. The step of corrugating is not considered wrinkling within the scope of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
196+, for combined corrugating and laminating.

SEE OR SEARCH CLASS:
8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 117 for chemical processes of crinkling cellulosic fibers.
162, Paper Making and Fiber Liberation, subclasses 111+ and 280+ for processes and apparatus for creping or crinkling paper.
264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses and especially subclass 282 for processes of wrinkling or creping, per se, of paper or plastic materials.

184 This subclass is indented under subclass 60. Processes combined with the step of moving one part of a single web or sheet in a substantially circular path with respect to another part such that at least one and one half convolutions of the web or sheet is formed and the one part is superimposed on the other part.

(1) Note. The wound part must overlap more than enough to merely form a good joint.

SEE OR SEARCH THIS CLASS, SUBCLASS:
162, for processes of winding a lamina combined with prestressing of the lamina.
171, for processes of winding a sheet or web combined with the step of winding a filament.
443+, for laminating apparatus including winding means.

SEE OR SEARCH CLASS:
242, Winding, Tensioning, or Guiding, for a process or apparatus for winding elongated material onto a core.

185 This subclass is indented under subclass 184. Processes in which the step of winding is about a separate nonwound core to which it is adhesively united.

SEE OR SEARCH THIS CLASS, SUBCLASS:
212+, for processes of bending a sheet to assume shape of configured lamina.

186 This subclass is indented under subclass 185. Processes in which the core is of spherical configuration.

187 This subclass is indented under subclass 185. Processes in which the core is a hollow tubular element.

188 This subclass is indented under subclass 187. Processes in which at least two separate webs are wound about a nonwound core one after the other.

(1) Note. Patents which define simultaneously feeding separate webs and

which are assembled at the point of contact with the core are considered within the scope of this subclass.

(2) Note. Winding of an assembly of webs is not considered a winding of at least two separated webs for the purposes of this subclass.

189 This subclass is indented under subclass 184. Processes in which the winding of the web or sheet is about a core to support the web or sheet during the winding operation without bonding the web or sheet to the core and a transverse cross-section of the core at any section along the length thereof is either (a) non-circular in cross-section or (b) circular in cross-section and at least two circular sections thereof are of different diameter.

(1) Note. Cores which are circular in cross-section and of the same diameter throughout are excluded from this subclass.

190 This subclass is indented under subclass 184. Processes directed to winding at least two separate webs or sheets about a removable core one after the other.

191 This subclass is indented under subclass 184. Processes having a step of associating parts by manipulations other than the winding operation.

(1) Note. The step of laminating two sheets and then winding the laminated sheets to form a wound product is included within the scope of this subclass.

192 This subclass is indented under subclass 191. Processes in which the additional assembly step occurs before the step of assembly by winding.

193 This subclass is indented under subclass 184. Processes combined with the step of cutting of the article produced by a winding operation.

(1) Note. Cutting of the wound body along a transverse cross-section perpendicular to the longitudinal axis of the wound body to produce a plurality of identical articles, e.g., cut off, is excluded from this subclass unless a dimension or shape of the article is defined in the claim.

SEE OR SEARCH THIS CLASS, SUBCLASS:
250+, for processes of laminating combined with a cutting operation.

194 This subclass is indented under subclass 184. Processes combined with the step of changing the shape of the article produced by the winding operation to a shape of different configuration.

SEE OR SEARCH THIS CLASS, SUBCLASS:
196+, for laminating processes combined with a shaping operation.

195 This subclass is indented under subclass 184. Processes which are directed to winding a sheet or web about a removable core or mandrel in such manner that the longitudinal edges of the sheet or web overlap or abut each other at the juncture of the successive convolutions to form a spiral tube-like article.

SEE OR SEARCH THIS CLASS, SUBCLASS:
425+, for laminating apparatus including spiral winding means.

196 This subclass is indented under subclass 60. Processes combined with a step of (1) distorting a workpiece by bending to alter its shape, (2) changing the gross over-all shape of a self-sustaining workpiece by a deforming operation or (3) altering the surface configuration only of a workpiece by raising bosses or protuberances thereon or causing surface portions to be depressed below the plane of the work surface.

(1) Note. The reshaping to a different configuration of a self-supporting workpiece may be by stretch-forming or by a drawing operation.

(2) Note. Stretching is not considered a reshaping operation for the purposes of this subclass, nor is cutting considered to be a deforming operation. See appropriate subclasses below for this art.

(3) Note. For a definition of "bending" as used in the above definition see the term as defined in the glossary of the class definition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

229, for laminating combined with stretching.

242+, for laminating combined with the step of forming a lamina by a molding or casting operation.

250+, for laminating combined with cutting.

443+, for laminating apparatus combined with reshaping means.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclasses 54+ for a process of bonding glass to a preformed part by a glassworking operation combined with the step of reshaping of the glass part prior to assembly or subsequent to bonding.

228, Metal Fusion Bonding, subclasses 141.1+ for a process of metallic bonding combined with mechanical shaping.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclass, for reshaping or deforming, per se, of paper or plastic materials.

428, Stock Material or Miscellaneous Articles, subclasses 98+ for a plural layer stock material product with structure, and especially indented subclasses 121+ for such a product with a fold at the edge, subclasses 156+ for such a product embodying a component of varying thickness, and subclasses 174+ for such a product embodying a component of nonplanar uniform thickness (e.g., corrugated, pleated).

197 This subclass is indented under subclass 196. Processes which are directed to the steps of bonding at spaced secured areas only and separating, expanding or opening at least one portion of a lamina at the nonbonded area from its contact with another portion of the same or different lamina.

(1) Note. Most of the patents in this subclass relate to making of honeycomb structures.

(2) Note. Patents which claim the step of opening or separating of the nonadherent areas of adhesively united laminae are included herein.

198 This subclass is indented under subclass 196. Processes in which the step of reshaping is by causing at least a portion of a hollow body to move inwardly from the periphery of the body and into contact with another portion.

(1) Note. In this subclass may be found, for example, sealing the ends of a tube by a pinching operation.

199 This subclass is indented under subclass 196. Processes in which the lamina subjected to the step of bending, reshaping or embossing is a flexible web of indeterminate length and wherein the bending, reshaping or embossing occurs during intermittent or continuous movement of the web.

SEE OR SEARCH THIS CLASS, SUBCLASS:

459+, for laminating apparatus combined with means to bend or fold an indefinite or running length flexible web.

200 This subclass is indented under subclass 199. Processes directed to the step of bending a web along or parallel to its longitudinal axis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

461+, for laminating apparatus combined with longitudinal bending means.

201 This subclass is indented under subclass 200. Processes in which the bending step occurs either before or while the web is being assembled with the part to which it is to be adhered.

202 This subclass is indented under subclass 200. Processes in which the web is turned over the edge of a separate workpiece with which it is assembled and distorted into facial contact therewith.

SEE OR SEARCH THIS CLASS, SUBCLASS:
216, for processes of overedge bending of a sheet about another sheet.

203 This subclass is indented under subclass 200. Processes in which the longitudinal edges of web are bent into contact with each other to overlap or abut to form a hollow tubular body.

204 This subclass is indented under subclass 199. Processes which involves bending one portion of a web and superimposing the bent portion of the lamina on the other portion of the same lamina, the two portions being in face to face contact to the bendline.

(1) Note. Pleating that is repeated back and forth folding is within the scope of this subclass.

(2) Note. In folding a sharp line of bend is made and the portions are brought into facial contact as distinguished from corrugating in which the product undulates and the adjacent faces are spaced after bending.

205 This subclass is indented under subclass 199. Processes in which the bending involves forming a web with alternate ridges and grooves with a component transverse to the longitudinal axis of the web.

SEE OR SEARCH THIS CLASS, SUBCLASS:
204, for transverse folding.
470, for laminating apparatus including corrugating means.
590+, for corrugating apparatus, per se.

SEE OR SEARCH CLASS:
264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclass 286 for processes of corrugating, per se.

206 This subclass is indented under subclass 205. Processes in which the step of corrugating takes place after the step of assembling at least two laminae.

207 This subclass is indented under subclass 205. Processes combined with the step of changing the shape of one of the corrugations of a corrugated lamina and/or cutting of a corrugated lamina.

(1) Note. The restriction of the term "cutting" is the same as stated in (1) Note of subclass 193 of this class.

SEE OR SEARCH THIS CLASS, SUBCLASS:
250, for laminating processes combined with a step of cutting.

208 This subclass is indented under subclass 205. Processes in which the corrugated lamina is of incipient adhesiveness or has a dry adhesive thereon and the lamina is physically or chemically treated other than by the application of an adhesive material to cause the surface of the lamina or dry adhesive coating thereon to become tacky or sticky.

SEE OR SEARCH THIS CLASS, SUBCLASS:
305, for processes of applying a solvent or chemical activating agent to an assembly of laminae.
306.3, for processes of autogenous bonding.

209 This subclass is indented under subclass 199. Processes in which the reshaping operation involves only the surface of the lamina and only partially through the thickness and wherein the overall shape of the lamina throughout its breadth and width is unaltered.

(1) Note. Embossing of a lamina is an example of a surface deformation operation within the scope of this subclass.

(2) Note. See the part (3) of the definition of subclass 196 of this class for the scope of the term "surface deformation".

SEE OR SEARCH THIS CLASS, SUBCLASS:
219, for processes of surface deformation of a nonrunning length lamina.
553, for laminating apparatus including a discontinuous or patterned press.

SEE OR SEARCH CLASS:
101, Printing, subclass 32 for processes of embossing or penetrating, per se.
144, Woodworking, subclass 358 for a process of embossing wood.

210 This subclass is indented under subclass 196. Processes in which the reshaping operation involves distorting a workpiece to form alternating ridges and grooves in wave like shape and bonding the workpiece to a generally planar lamina whereby the ridges only are in contact with the lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
292, for processes of laminating, per se, of laminae having opposed facing areas out of contact.

211 This subclass is indented under subclass 196. Processes combined with the step of slitting and/or removal of a portion of the material at the reshaping or bending areas only of a lamina.

(1) Note. The purpose of the slitting and/or removal of material is to prevent formation of undulations, gathers or bulges at the bending or reshaping area.

212 This subclass is indented under subclass 196. Processes in which a lamina is forced to assume the configuration of a shaped lamina as it is brought into association therewith; the shaped lamina serving as the form against which the other lamina is distorted.

SEE OR SEARCH THIS CLASS, SUBCLASS:
229, for stretching of a lamina, per se.

213 This subclass is indented under subclass 212. Processes involving completely enclosing the configured lamina by the lamina or laminae being reshaped.

(1) Note. This subclass includes enclosing the configured lamina by utilization of more than one additional lamina, e.g., enclosing a sphere by two semi-spherical laminae formed in situ on the sphere.

214 This subclass is indented under subclass 212. Processes combined with the step of shaping a body to form configured lamina before association with the adhered lamina.

215 This subclass is indented under subclass 212. Processes in which the configured lamina is cylindrical.

216 This subclass is indented under subclass 196. Processes in which a portion of a lamina extending beyond the edge of a sandwich is folded over the edge and back against the opposite face of the sandwich.

SEE OR SEARCH THIS CLASS, SUBCLASS:
202, for processes for bending a running length lamina over the edge of a different part.

217 This subclass is indented under subclass 196. Processes in which the reshaping is of a part of a single lamina to juxtapose marginal portions thereof in either butt or lapped positions and the juxtaposed portions are secured one to the other.

(1) Note. The one piece blank may be composite, i.e., formed of a plurality of laminae or of parts integrated as a unit.

SEE OR SEARCH CLASS:
228, Metal Fusion Bonding, subclasses 144+ for the process of metallurgically bonding the margins of a one-piece blank.

218 This subclass is indented under subclass 217. Processes in which the article produced by the reshaping operation is a hollow cylinder.

SEE OR SEARCH THIS CLASS, SUBCLASS:
215, for processes of wrapping a sheet about a cylindrical core to form a cylindrical cover thereon which is adhesively bonded to the core.

SEE OR SEARCH CLASS:
72, Metal Deforming, subclasses 48+ for a method or machine within the scope of the class which includes a step of or

means for press-seaming the edges of a single metal blank to form a tube.

162, Paper Making and Fiber Liberation, subclass 118 for processes of making tubes combined with paper making.

219 This subclass is indented under subclass 196. Processes in which the surface configuration only of a workpiece is altered by raising bosses or protuberances thereon or causing surface portions to be depressed below the plane of the workpiece surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

209, for processes of deforming a web-surface and the search notes therein.

220 This subclass is indented under subclass 219. Processes in which the step of deforming the surface only occurs after the parts have been brought into assembled relationship.

(1) Note. Embossing of an assembly of laminae in which the adhesive may not be completely cured are included herein.

221 This subclass is indented under subclass 196. Processes in which the bending or reshaping occurs after the parts have been brought into assembled relationship.

(1) Note. The assembled laminae need not be adhesively bonded for the purposes of this and indented subclasses.

222 This subclass is indented under subclass 221. Processes in which the assembly is composed only of superimposed parallel sheets in face to face contact.

223 This subclass is indented under subclass 222. Processes directed to the bending of only one lamina of the assembly of laminae.

(1) Note. Processes in which one lamina of an assembly is not subjected to a bending operation and a sandwich associated therewith is subjected to a bending operation is included herein.

224 This subclass is indented under subclass 222. Processes in which the product produced by the bending or reshaping operation on a plurality of stacked sheets has a concavity or hollow portion.

(1) Note. Processes of making semi-cylindrical products are included herein.

226 This subclass is indented under subclass 221. Processes in which the assembly of laminae is subjected to the step of bending at least one portion of the assembly relative to the remaining portion of the assembly such that the first portion is superimposed upon and in facial contact with the other portion in which this type of bending constitutes the sole bending operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

202, for processes of longitudinally folding a running length web.

SEE OR SEARCH CLASS:

270, Sheet-Material Associating, appropriate subclasses for folding, per se.

227 This subclass is indented under subclass 196. Processes including a step of folding a lamina.

(1) Note. See subclass 226 of this class for a definition of the term “folding” and the search notes appended thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:

226, for processes of bending an assembly of laminae and search (1) Note above.

228 This subclass is indented under subclass 60. Processes directed to bonding of configured lamina involving the application of recessed press platens in which the shape of the recesses conform to the shape of the configured laminae.

(1) Note. In this subclass, the shaped platens impart no shape to the sandwich, merely applying the laminating pressure. The platens are configured for the purpose of evenly pressing the sandwich.

229 This subclass is indented under subclass 60. Processes combined with the step of applying sufficient tension to a lamina to increase its effective length or breadth or both.

(1) Note. See subclass 160 of this class, (2) Note, for a restriction on the scope of the term "stretching".

SEE OR SEARCH THIS CLASS, SUBCLASS:

160, for processes of stretching a lamina and uniting the lamina to another lamina while maintained in stretch condition and see (1) Note above.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 132 for processes of stretching artificial fibers combined with swelling or plasticizing.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses, for processes within the class definition for shaping or molding which may include a stretching step, particularly subclass 197, 198, 210.1, 235.6, 288.4, and 291+.

427, Coating Processes, subclasses 171+ for coating combined with a stretching or tensioning step.

230 This subclass is indented under subclass 60. Processes in which a lamina bonded to a carrier is, assembled with a base, caused to adhere to the base and then subsequently the adhesive bond between the lamina and carrier is destroyed to free the lamina and base from the carrier.

(1) Note. The step of utilizing an apparatus which includes an adhesive coated surface for the purpose of removing an element from a stack of elements and transferring the element to an adhesive coated base (e.g., picker) is not considered direct transfer for this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

8+, for processes of transferring a resist combined with etching.

89.11+, for processes of vitrification or firing of ceramic material which may have been applied to a base by a transfer mechanism.

249, for processes wherein an adhered lamina is stripped from a base and subsequently adhered to a different surface.

540+, for apparatus used to perform a direct transfer operation.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 467 for processes of transferring dyes and discharges and for dye containing transfers.

101, Printing, appropriate subclasses, particularly subclass 34, 401.1, 463 for processes utilizing transfers for preparation of printing surfaces; subclass 464 for film to film imbibition; and subclasses 468+ for copying processes (e.g., hectographic).

427, Coating Processes, subclasses 146+ for processes of making a transfer or copy sheet by a coating operation.

428, Stock Material or Miscellaneous Articles, subclasses 40.1+ for a composite stock material product having a layer of adhesive and a covering therefor which must be removed or stripped to expose the adhesive and enable it to be adhered to a surface; subclass 352 for a composite stock material having an adhesive outermost surface and also having a release or anti-stick coating (usually on the surface opposite the adhesive surface).

231 This subclass is indented under subclass 230. Processes directed to the steps of forming a lamina by casting or molding on an endless belt or calender roll carrier, contacting the lamina while on the carrier with a preformed base and thereafter removing the lamina from the carrier.

SEE OR SEARCH THIS CLASS, SUBCLASS:

238, for direct transfer processes employing a running length flexible web carrier.

242+, for laminating processes combined with molding or casting a lamina.

500+, for laminating apparatus including means for casting or molding a lamina.

232 This subclass is indented under subclass 230. Processes wherein the carrier, on which the lamina is applied or formed, has a configured surface so that the applied or formed lamina will be shaped or molded into a desired configuration or pattern.

SEE OR SEARCH THIS CLASS, SUBCLASS:
245, for lamina formation by casting or molding in a configured mold.

233 This subclass is indented under subclass 230. Processes wherein the transferred lamina is of thin metallic sheet or foil.

(1) Note. The metallic sheet or foil may be of unitary composition or may be metal particles sprayed or deposited on a base and treated, if necessary, with a suitable binder to form a cohesive layer, prior to transfer thereof.

(2) Note. Metal layers applied to the carrier by a coating process (e.g., electrodeposition) shall be considered to be "foils".

SEE OR SEARCH THIS CLASS, SUBCLASS:
150+, for laminating processes including the production of transfer laminae by electrodeposition.

234 This subclass is indented under subclass 230. Processes wherein only a portion of the lamina on the carrier is transferred to the base, the remainder staying adhered to the carrier.

(1) Note. This subclass includes both the processes wherein the transferred portion is a top section of the lamina with a continuous thickness remaining on the carrier, or where continuous or discontinuous strips or parts of the lamina through the total thickness thereof are transferred.

SEE OR SEARCH THIS CLASS, SUBCLASS:
254, for splitting of sheet lamina in plane intermediate of its faces.
261, for processes of punching sections through a lamina and simultaneously applying laminating pressure to the cutout sections with the same punching device.

235 This subclass is indented under subclass 230. Processes which include more than one direct contact transfer operation and/or a laminating step other than direct contact transfer.

(1) Note. The additional lamination herein may be to the transferred lamina or laminae, or the base plus transferred lamina may be bonded to still another surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:
239+, for simultaneous transfer of plural superimposed laminae by a single direct transfer operation.

236 This subclass is indented under subclass 230. Processes wherein the transfer is aided by solvent action to facilitate release of the lamina from the carrier, said solvent being a fluid other than water, per se.

(1) Note. An aqueous composition containing a nonwater component is within the scope of this subclass.

237 This subclass is indented under subclass 230. Processes wherein the transferred lamina receives a coating subsequent to transfer thereof from carrier to base.

SEE OR SEARCH THIS CLASS, SUBCLASS:
280, for coating of a nonadherent surface of a lamina subsequent to lamination thereof.

238 This subclass is indented under subclass 230. Processes in which the carrier employed is a running or continuous length flexible web.

SEE OR SEARCH THIS CLASS, SUBCLASS:
231, for processes wherein the lamina is cast or molded on an endless belt or calender roll.

239 This subclass is indented under subclass 230. Processes wherein a plurality of superimposed laminae on the carrier are simultaneously transferred.

(1) Note. Transfer of a plurality of coatings of the same composition is considered the same as transfer of a single coating; however, if the ingredients of each coating are identical but differ in proportion, the coatings are considered different coatings for the purposes of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
235, for processes involving plural sequential transferring operations and/or with additional lamination.

240 This subclass is indented under subclass 239. Processes wherein the transferred laminae are in the form of printing or a design.

(1) Note. See the search notes to this class, subclass 230 for processes involving transfer of resist patterns, ceramic designs, dyes and discharges, and/or printing.

SEE OR SEARCH THIS CLASS, SUBCLASS:
277, for printing processes combined with a laminating step.

241 This subclass is indented under subclass 230. Processes wherein the lamina is transferred from the carrier to a base which has been previously coated with an adhesive agent.

242 This subclass is indented under subclass 60. Processes combined with the step of forming a lamina by a molding or casting operation.

(1) Note. The step of simultaneously molding and uniting combined with a laminating step is included herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:
231, for molding or casting of a lamina on a carrier prior to direct transfer thereof.
500+, for apparatus including means for casting a lamina.

SEE OR SEARCH CLASS:
65, Glass Manufacturing, subclasses 45+ for a process of bonding of glass to a formed part by a glassworking operation combined with a step of forming a glass part from molten glass.
264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses, for processes for molding or shaping plastic materials within the class definition, particularly those subclasses pertaining to composite article formation, e.g., as by extruding a plastic material around a preform, see subclasses 45.1+, 112+,171.1+, 241+ and 642+. Class 264 further provides for uniting spaced parts by flowing a fluent material therebetween, even though for a processthe function of said material is disclosed to be merely to bond, just so long as the parts to be united are placed in final spaced relationship before said material is introduced, see particularly subclasses 261+. For a more comprehensive line between Class 156 and Class 264 see the class definition of Class 264.

243 This subclass is indented under subclass 242. Processes directed to casting or molding plural continuous webs which webs are either bonded to each other or to different laminae or surfaces.

244.11 By extrusion:
This subclass is indented under subclass 242. Processes in which the lamina formation is by extrusion or die expressing.

244.12 Encapsulating or enclosing a lamina:
This subclass is indented under subclass 244.11. Processes wherein the lamina is completely covered or enclosed by another lamina, or wherein an elongated or indefinite length article excluding the extreme ends is enclosed.

244.13 Hollow article or lamina:
This subclass is indented under subclass 244.11. Processes wherein a lamina or the article produced is hollow.

244.14 Differential fluid pressure used:
This subclass is indented under subclass 244.13. Processes wherein a positive or negative pressure is applied through the medium of a liquid or gas.

244.15 Specific nonuniform lamina or article; e.g., netting or rib and groove, etc.:
This subclass is indented under subclass 244.13. Processes wherein an article other than a continuous uniform thickness tube or the like is produced, or wherein a lamina is nonuniform.

(1) Note. Netting and articles with rib and groove elements are included in this subclass.

244.16 With printing:
This subclass is indented under subclass 244.11. Process with a printing step.

(1) Note. The printing in this subclass includes the printing of an adhesive.

SEE OR SEARCH CLASS:
101, Printing, appropriate subclasses for printing processes, per se.
162, Paper Making and Fiber Liberation, subclass 134 for processes of making paper combined with a printing step.

244.17 Electrical, magnetic, or wave energy used:
This subclass is indented under subclass 244.11. Processes which include the step of (1) passing an electric current directly through the article or a lamina, (2) subjecting the article or a lamina to an electric or magnetic field, or (3) directly applying radiant energy to the article or a laminae.

(1) Note. This subclass includes use of energy as a pretreatment or post-treatment as well as during bonding of one or more laminae.

(2) Note. The wave energy applied to the work may be light, emanations of radioactive material, infrared rays, ion bombardment, etc..

244.18 With cutting, severing, or perforating:
This subclass is indented under subclass 244.11. Processes combined with a step or (1) penetrating the article or a lamina to achieve at least partial separation of a portion of the material of the workpiece, or (2) moving one part of the article or a lamina relative to the other to cause separation of the parts.

(1) Note. The cutting, severing, or perforating may be prior to, during, or after the bonding step and of any lamina.

244.19 After bonding; e.g., as finishing step, etc.:
This subclass is indented under subclass 244.18. Processes wherein the cutting, severing, or perforating step is performed after bonding.

244.21 Differential fluid pressure used:
This subclass is indented under subclass 244.11. Processes including the application of positive or negative pressure to the work through the medium of a liquid or gas.

(1) Note. Use of steam pressure solely as a source of heat is not included in this subclass.

244.22 Bonding spaced preforms:
This subclass is indented under subclass 244.11. Processes where laminae in spaced relationship (plural laminae or bonding a lamina to itself) are bonded by means of another element which is self-sustaining, e.g., a bead of adhesive, etc..

(1) Note. Included herein are methods using a pair of spaced rollers through which two laminae are fed with an intermediate preform therebetween to effect bonding.

SEE OR SEARCH CLASS:
264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 261+ for introducing fluent bonding material between spaced preforms.

244.23 Pretreatment:
This subclass is indented under subclass 244.11. Processes including a treatment to prepare or adapt a lamina for the bonding step wherein mere heating is not sufficient.

(1) Note. Mere broad recitation of heating of a lamina to render adhesive is not sufficient; however, detailed heating steps for such, e.g., reciting conditions, degree of heating or treating segments only, etc., is included.

244.24 Post-treatment:
This subclass is indented under subclass 244.11. Processes which includes a step of after treatment of the bonded article.

(1) Note. Final curing of an assembled lamina to perfect or complete bonding is considered a part of the bonding step and not an after treatment for this subclass.

244.25 Article or at least one lamina of nonuniform thickness or discontinuous:
This subclass is indented under subclass 244.11. Processes wherein the method includes bonding of a nonuniform or discontinuous lamina, or where a nonuniform article is produced, e.g., curved edges.

(1) Note. This subclass is intended to include a lamina or an article having a discontinuous layer, i.e., apertured or a layer formed of separate pieces of material, e.g., a ribbed article.

(2) Note. This subclass includes uniform lamina but wherein the bonding is nonuniform, i.e., discontinuous or spot bonding.

244.26 Bonding in specified environment (other than temperature):
This subclass is indented under subclass 244.11. Processes including employment of conditions other than ambient in the bonding step, e.g., pressure, etc., use of particular medium, e.g., steam or reactive vapor during the bonding, etc.

244.27 Pressure assisted bonding:
This subclass is indented under subclass 244.11. Processes including positive recital of use of mechanical pressure to assist in the bonding step, e.g., use of platens or a pair of pressure rolls, etc.

245 This subclass is indented under subclass 242. Processes in which the lamina formation is performed in a configured mold to impart a desired shape or particular conformation to the lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
225, for reshaping of at least one lamina in a closed configured mold by plastic flow subsequent to assembly of said lamina with at least one other lamina or to one other surface.

SEE OR SEARCH CLASS:
65, Glass Manufacturing, subclasses 47+ for a process of bonding glass by glassworking operation including a step of forming the glass in a mold cavity.

246 This subclass is indented under subclass 242. Processes directed to casting a film on a temporary flat, plane surface and thereafter stripping the film from the surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:
230+, for processes wherein a lamina is formed by casting on carrier for direct transfer of said lamina to a different base or surface.
249, for stripping of an adhered lamina from one surface and applying it to a different surface.

SEE OR SEARCH CLASS:
264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses, particularly subclass 165, 212, 298, and 299+.
427, Coating Processes, subclasses 154+ for applying a removable protective coating to a substrate.

247 This subclass is indented under subclass 60. Processes wherein a laminating procedure is combined with the step of removing at least one previously adhered lamina by a stripping or delaminating operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
254, for processes for splitting a sheet lamina in a plane intermediate of its faces.
344, for delaminating processes, per se.
584, for delaminating apparatus.

SEE OR SEARCH CLASS:
427, Coating Processes, subclasses 154+ for processes of applying a removable protective coating.
428, Stock Material or Miscellaneous Articles, subclasses 40.1+ for a composite stock material product having a layer of adhesive and a covering therefor which must be removed or stripped to expose the adhesive and enable it to be adhered to a surface; subclass 352 for a composite stock material having an adhesive outermost surface and also having a release or anti-stick coating (usually on the surface opposite the adhesive surface).

248 This subclass is indented under subclass 247. Processes combined with the step of cutting only one of the laminae while still adhered and prior to stripping thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
268, for partial cutting, incising or grooving of a laminated sandwich.

249 This subclass is indented under subclass 247. Processes including the step of uniting the stripped lamina to a different element or surface other than the lamina from which the lamina has been stripped.

SEE OR SEARCH THIS CLASS, SUBCLASS:
152, for processes in which the stripped lamina is reunited to the same lamina from which it was previously separated.

250 This subclass is indented under subclass 60. Processes combined with a step of (1) penetrating the workpiece to achieve at least partial separation of a portion of the material of the workpiece without substantial reshaping flow of the material or (2) moving one part of a workpiece relative to the other to cause failure by tension at the point of separation.

(1) Note. A disclosure that the work material flows due to melting will not preclude placement of the patent here where the flow merely accomplishes reshaping only necessary for penetration. For example, cut-seaming a thermoplastic material with a hot knife is here even though the material may form a bead at the seam.

(2) Note. The cutting need not be entirely through the thickness of the work, but may be only partially through the thickness e.g., grooving and scoring.

(3) Note. Cutting of a lamina along a transverse cross-section perpendicular to the longitudinal axis of the lamina to produce a plurality of identical articles e.g., cut-off, is excluded from this and indented subclass unless a dimension or shape of the lamina is specified.

SEE OR SEARCH THIS CLASS, SUBCLASS:
98, for reclaiming, renewing or repairing of articles for reuse with removal of defective area to be repaired.
101, for processes of making optically transparent glass sandwiches with cutting of interlayer or lamina.
142, for processes of forming an endless drive belt and cutting the belt to V or trapezoid shape.
159, for processes of splicing indefinite length lamina end-to-end with cutting of joining ends.
193, for processes of winding a web or sheet with cutting or wound body.
211, for processes of laminating with permanent bending or reshaping which include slitting or removal of material at reshaping area prior to reshaping.

510+, for apparatus for surface bonding and/or assembly combined with means for cutting, punching, piercing or severing.

SEE OR SEARCH CLASS:
83, Cutting, appropriate subclasses for processes of and apparatus for cutting and see especially the notes to the class definition of that class for the locus of other art relating to cutting and combinations of cutting with other operations.
225, Severing by Tearing or Breaking, appropriate subclasses for processes of severing by tearing or breaking.
234, Selective Cutting (e.g., Punching), appropriate subclasses for processes and apparatus for selective punching.

251 This subclass is indented under subclass 250. Processes in which the laminae are bonded to each other during the cutting operation.

(1) Note. Included in this subclass, for example, are processes which involve the utilization of a heated cutting implement which, during the cutting operation, makes thermoplastic laminae tacky, thereby causing the portions of the lamina on each side of the cutting tool to become adhesively united.

SEE OR SEARCH THIS CLASS, SUBCLASS:
88, for fray prevention processes which may involve trimming and/or sealing of laminate edges.
515, for cutting apparatus which simultaneously unites the laminae.

252 This subclass is indented under subclass 250. Processes in which the cutting operation forms a closed perimeter opening extending completely through a lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
513+, for laminating apparatus having means for making a hole or aperture in a lamina.

SEE OR SEARCH CLASS:
29, Metal Working, subclass 22 for tire punching.
83, Cutting, subclass 30 for processes of puncturing.
234, Selective Cutting (e.g., Punching), appropriate subclasses for selective cutting or punching, per se.

253 This subclass is indented under subclass 252. Processes in which the laminae are assembled prior to the perforating operation.

254 This subclass is indented under subclass 250. Processes in which a sheet-like lamina is separated along a plane paralleling and between the two faces of the lamina and thus results in at least two laminae.

SEE OR SEARCH CLASS:
428, Stock Material or Miscellaneous Articles, subclasses 40.1+ for a composite stock material product having a layer of adhesive and a covering therefor which must be removed or stripped to expose the adhesive and enable it to be adhered to a surface; subclass 352 for a composite stock material having an adhesive outermost surface and also having a release or anti-stick coating (usually on the surface opposite the adhesive surface).

255 This subclass is indented under subclass 250. Processes in which a workpiece and cutter are rotated relative to one another and during rotation the workpiece is cut to produce therefrom a planar lamina, the line of cutting starting at the periphery of working and inwardly of the body toward the axis of revolution.

SEE OR SEARCH CLASS:
144, Woodworking, subclass 207 for peeling of bark from osiers (to be used in making wicker furniture) and subclasses 208.1+ for peeling of bark, generally.

256 This subclass is indented under subclass 250. Processes in which the cutting, punching, tearing or severing is performed prior to the association of the laminae.

257 This subclass is indented under subclass 256. Processes in which a lamina is cut (1) only partially through a workpiece thickness or (2) partially along the width whereby the workpiece is not separated into plural discrete workpieces.

(1) Note. Processes directed to scoring of a lamina to be joined with another lamina is within the scope of this subclass.

(2) Note. The partial cutting can be through an edge surface as well as through a facing surface of a sheet-like lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:

268, for processes where the laminae are associated and then there is a partial cutting.

SEE OR SEARCH CLASS:

83, Cutting, subclass 861 for processes and apparatus for cutting other than completely through the work.

258 This subclass is indented under subclass 256. Processes in which the cutting occurs only on edge surfaces to be bonded one to the other.

SEE OR SEARCH THIS CLASS, SUBCLASS:

159, for splicing methods in which the joining edges of indefinite length laminae have been cut or beveled.

535, for means for laminating combined with means of shaping, scarifying or cleaning joining surfaces.

259 This subclass is indented under subclass 256. Processes directed to uninterruptedly slitting a web-like lamina in a line parallel to its longitudinal axis.

260 This subclass is indented under subclass 259. Processes in which the slitting operation produces a plurality of laminae which are thereafter superposed so that a broad surface of one lamina is bonded to a broad surface of the other.

SEE OR SEARCH THIS CLASS, SUBCLASS:

264+, for processes of cutting plural laminae from single stock and assembling to each other not involving a continuous longitudinal cutting step.

261 This subclass is indented under subclass 256. Processes directed to cutting of a discrete product out of the confines of a workpiece through its thickness so that the cut does not intersect any edge of the workpiece and using the cutting implement to exert pressure upon the product in order to bring the product into association with another lamina.

SEE OR SEARCH CLASS:

83, Cutting, appropriate subclasses for processes and apparatus for punching.

262 This subclass is indented under subclass 261. Processes in which the product cut out is applied to the internal surface of a closure cap.

(1) Note. Processes of applying a liner to bottle caps by punching the liner from a workpiece and applying the liner by means of the punch are included in this subclass.

263 This subclass is indented under subclass 256. Processes directed to independently cutting at least two sheets or webs while not in contact with each other.

SEE OR SEARCH THIS CLASS, SUBCLASS:

511, for surface bonding apparatus combined with plural severing means for separate workpieces.

264 This subclass is indented under subclass 256. Processes in which stock material is cut into more than one lamina and the resultant laminae are (1) laminated to each other; or (2) more than one of the laminae are bonded to a separate and independent lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:

260, for processes including a step of continuous longitudinal slitting followed

by face to face laminating of the parts cut from the single sheet.

512, for apparatus under the class definition combined with severing followed by association of parts from the same source.

265 This subclass is indented under subclass 264. Processes in which the plural laminae are each applied to a single face of an additional lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:

297+, for processes of laminating plural discrete laminae to a single face of an additional lamina.

266 This subclass is indented under subclass 264. Processes in which the extremity of one of the plural laminae is associated with the extremity of another of the plural laminae cut from the stock material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

49, for processes of splicing indefinite length conductors.

157+, for processes of splicing indefinite length lamina end-to-end.

267 This subclass is indented under subclass 250. Processes in which the step of cutting or severing is performed subsequent to lamination and is for the removal of superfluous portions of the sandwich or removal of that superfluous portion of the sandwich which extends beyond the sandwich joint.

268 This subclass is indented under subclass 250. Processes combined with the step of (1) partially cutting, incising or grooving through a portion of the thickness of one lamina of a sandwich or (2) cutting through the entire thickness of only one of the laminae of a sandwich, the cutting occurring within the adhered area of the sandwich.

(1) Note. Processes directed to scoring, grooving or incising of the laminated material are found in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

257, for the partial cutting of laminae prior to association.

270, for processes of cutting one web only in which the cutting is subsequent to lamination and the cutting occurs other than within the confines of both laminae.

SEE OR SEARCH CLASS:

83, Cutting, subclasses 861+ for processes and means of cutting other than completely through the work.

269 This subclass is indented under subclass 250. Processes in which the severing operation is performed on a workpiece of indefinite length or continuously moving during the cutting operation.

(1) Note. See the class definition,Glossary for the definition of “Indefinite Length Work”.

270 This subclass is indented under subclass 269. Processes in which only a single web is cut.

SEE OR SEARCH THIS CLASS, SUBCLASS:

268, for processes of cutting one lamina only in which the cutting occurs within the surface area of both laminae.

271 This subclass is indented under subclass 269. Processes in which the laminated material is uninterruptedly cut in a line parallel to its major axis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

259, for processes of longitudinally cutting a lamina prior to its lamination to another lamina.

272.2 With direct application of electrical, magnetic, or radiant energy to work:
This subclass is indented under subclass 60. Processes which include the step of (a) passing an electric current directly through the work, (b) subjecting the work to a changing electric

field, or (c) directly applying magnetic or radiant energy to the work.

(1) Note. Work is the object or material which results from, or is intended to be subjected to, an adhesive bonding.

(2) Note. The electrical energy or wave energy must act directly on the work and not, for example, by connection or conduction of heat from an element not constituting part of the work.

(3) Note. The wave energy applied to the work may be light, ultraviolet rays, infrared rays, X-rays, cathode rays and emanations of radioactive material by particle emission, electron bombardment, electromagnetic fields, and like sources.

SEE OR SEARCH THIS CLASS, SUBCLASS:

379.6, for adhesive-bonding apparatus having means applying electrical, electrostatic, or wave energy to work.

SEE OR SEARCH CLASS:

29, Metal Working, appropriate subclasses for processes of metal working or shaping comprising a plurality of operations which include an adhesive-bonding step along with a metal-shaping step. Note especially subclass 900 for a process or apparatus for assembling articles or materials by means of an enduring electrostatic charging of the work; and subclasses 592.1+ for methods of making electrical devices which may include an electrostatic charging of laminate.

118, Coating Apparatus, subclasses 715+ for coating apparatus with means to apply electrical energy to work and/or coating material and means to contact the work with coating material in a gaseous or vaporous state; and subclasses 620+ for coating apparatus in general provided with means to apply electrical energy to work and/or coating material.

162, Paper Making and Fiber Liberation, subclass 50 and 192 for processes of utilizing electrical energy in a paper-making operation.

204, Chemistry: Electrical and Wave Energy, subclasses 155+, 157.15, and 164 for electrical or wave energy treatment of surfaces to effect a chemical change in the surface.

219, Electric Heating, appropriate subclasses for electric heating, per se.

250, Radiant Energy, subclasses 324+, for methods and apparatus for the corona irradiation of material; subclasses 453.11+ for methods and apparatus including supports for irradiating objects; and subclasses 492.1+ for methods and apparatus for the irradiation of objects generally.

427, Coating Processes, search subclasses 457+ for coating processes utilizing the direct application of electrical, magnetic, wave, or particulate energy.

272.4 Involving magnetically susceptible lamina or incorporating into the work a particulate susceptor material having magnetic properties:

This subclass is indented under subclass 272.2. Processes wherein at least one of the laminae to be bonded contains, or is coated with, a particulate susceptible material having magnetic properties, or wherein at least one of the lamina to be bonded is capable of being heated by a magnetic field.

272.6 Exposure of work to corona or glow discharge:

This subclass is indented under subclass 272.2. Processes wherein means are provided for impacting the work (either before or after assembly) with ions resulting from the incomplete electrical discharge from an electrode.

(1) Note. This subclass includes those processes of using corona or glow discharge to form a permanent bond in the work without the further use of other electrical, magnetic, or radiant energy and those processes of using corona or glow discharge to form an incomplete bond in the work before the further application of electrical, magnetic, or radiant energy.

SEE OR SEARCH THIS CLASS, SUBCLASS:
273.1, for processes of forming a bond by an electrostatic charge.

SEE OR SEARCH CLASS:
250, Radiant Energy, subclasses 324+ for methods and apparatus for the corona irradiation of material.

272.8 Exposure of work to laser:
This subclass is indented under subclass 272.2. Processes wherein said energy is applied in the form of natural oscillations of atoms or molecules between energy levels for generating coherent electromagnetic radiation in the ultraviolet, visible, or infrared regions of the spectrum.

273.1 Developing electrostatic charge:
Processes under 272.2 wherein at least one lamina is electrostatically charged in order to enhance the formation of a permanent bond in the work.

SEE OR SEARCH CLASS:
29, Metal Working, subclass 900 for processes or means for assembling by charging of work.
219, Electric Heating, subclasses 600+ for inductive heating, subclasses 678+ for microwave heating, and subclasses 764+ for capacitive dielectric heating.
361, Electricity: Electrical Systems and Devices, subclasses 225+ for a process of imparting an electrical charge to a material or object.

273.3 Before final assembly; e.g., to cure lamina, etc.:
This subclass is indented under subclass 272.2. Processes wherein electrical, magnetic, or radiant energy is applied to lamina prior to assembly of final work product.

273.5 Before and after final assembly:
This subclass is indented under subclass 273.3. Processes wherein electrical, magnetic or radiant energy is applied in two different steps, one of which is prior to and the other after final assembly of work product.

273.7 Applying pressure before electrical, magnetic, or radiant energy:
This subclass is indented under subclass 272.2. Processes wherein pressure is applied to work (either prior to or before final assembly of the work product) before the work is treated with electrical, magnetic, or radiant energy.

(1) Note. This subclass includes those processes wherein pressure is applied to the work to assemble the final product, provided such pressure is precedent to the application of electrical, magnetic, or radiant energy.

273.9 Work constitutes conductor or electrical circuit:
This subclass is indented under subclass 272.2. Processes wherein at least a portion of the work after final assembly is a conductor which is to be used as a component of an electric circuit to which an electric current is to be directly applied.

(1) Note. This subclass includes subjecting metal work to an electric field which causes a current to be developed within the work, thereby resulting in heating of the metal work.

SEE OR SEARCH THIS CLASS, SUBCLASS:
47+, for processes of making running or indefinite length electrical conductors.
272.2, and 275.1 - 275.7, and other appropriate subclasses for a process of adhesive bonding which includes subjecting metal work to a radiant or magnetic field.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 592+ for processes of manufacturing devices from metal which produce or use electrical energy.
219, Electric Heating, subclasses 653+ and 775+ for an article or material support conveyor used in a process wherein the work or electric field or both move relative to each other in an electric field.

252, Compositions, subclasses 500+ for conductive and emission compositions and electrical devices defined solely in terms of their composition with no claimed significant composition with no claimed significant device structure. These devices include electrodes, filaments, or shields for electric lamps and electric space discharge devices, welding electrodes, contacts, switches, brushes, and resistances.

274.2 Conductor is a coil:
Processes under 273.9 wherein a coil conductor is incorporated into the work.

(1) Note. This subclass provides for electric resistance wires coiled around lamina before the application of said energy, said wire constituting part of the work.

274.4 Exposure of work to electrode:
This subclass is indented under subclass 272.2. Processes wherein an electrode is used to impart energy to the work product after final assembly.

(1) Note. An electrode is a device by which an electric current passes into or out of a cell, apparatus, or body, and includes a simple wire.

SEE OR SEARCH CLASS:
252, Compositions, subclasses 500+ for electrodes defined solely in terms of their composition with no claimed significant device structure.

274.6 Continuously moving work in relation to electrode:
This subclass is indented under subclass 274.4. Subject matter in which the work moves relative to the electric field produced by the electrode.

274.8 With application of adhesive:
This subclass is indented under subclass 274.4. Subject matter wherein an adhesive is applied to at least one lamina before the work is exposed to the electric field produced by the electrode.

275.1 Only part of contacting lamina surfaces bonded; e.g., seaming, etc.:
This subclass is indented under subclass 272.2. Processes wherein bonding of contacting lamina surfaces occurs only at selected contacting areas.

SEE OR SEARCH THIS CLASS, SUBCLASS:
292, for processes for bonding two contacting laminae which have opposed portions out of contact or spaced from each other and which does not use electrical, magnetic, or radiant energy.
308.4, for bonding two contacting laminae without the use of an extraneous adhesive material at selected contacting areas without the use of electrical, magnetic, or radiant energy.

275.3 With application of adhesive:
Processes under 275.1 wherein an adhesive is applied to at least one lamina.

275.5 To polymerize or cure material in work:
This subclass is indented under subclass 272.2. Processes wherein said energy is used in a bonding to induce a chemical reaction in which molecules are united to produce material of higher molecular weight than the starting material.

275.7 With application of adhesive:
This subclass is indented under subclass 272.2. Process wherein an adhesive is applied to a lamina.

276 This subclass is indented under subclass 60. Processes in which the particulate material is applied to that surface of a lamina which will be bonded to a different lamina.

277 This subclass is indented under subclass 60. Processes combined with the step of applying a coating to a lamina, which coating is in the nature of a design or character and is applied by a member carrying the configured coating.

(1) Note. The printing in this subclass includes the printing of an adhesive.

SEE OR SEARCH CLASS:
101, Printing, appropriate subclasses, for printing processes, per se.
162, Paper Making and Fiber Liberation, subclass 134 for processes of making paper combined with a printing step.

278 This subclass is indented under subclass 60. Processes combined with the step of applying a coating material or compound to a surface of at least one lamina spaced from or other than that which is bonded.

(1) Note. Impregnation of a part with a coating material whose sole function is to bond parts together is excluded from this and indented subclasses even though the impregnating step may incidentally apply a coating to the nonadherent face of the part.

SEE OR SEARCH CLASS:
427, Coating Processes, appropriate subclasses, for processes of coating in general.

279 This subclass is indented under subclass 278. Processes in which a fluent material comprised of discrete particles is applied to a lamina which particles are not, per se, adhesive for the purpose of bonding laminae.

(1) Note. The step of applying particulate material while suspended in a liquid is not within the scope of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
26+, for processes of associating discrete fibers or particulate material only to form a self-supporting lamina.
283, for processes of applying particles which are utilized as a bonding medium in assembly of plural laminae.

SEE OR SEARCH CLASS:
51, Abrasive Tool Making Process, Material, or Composition, subclass 297 for a method of making abrasive particles in which a laminating step is employed.
427, Coating Processes, subclasses 180+ for coating processes wherein solid particles or fibers are applied.

280 This subclass is indented under subclass 278. Processes directed to the step of coating of the nonadherent face of a lamina subsequent to its bonding to another lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
305, for laminating processes whereby the adhesive, per se, is applied after assembly of the laminae.

281 This subclass is indented under subclass 60. Processes combined with a step which is, per se, (1) not provided for in this class and (2) performs a function other than that usually utilized during the fabrication of the laminated product to perfect the bonding between the laminae.

(1) Note. The combination of assembly and/or joining by bonding with a step of sewing other than through the bonded joint is provided for in this subclass. Also included herein is application of pressure to reduce the overall thickness of the sandwich, the pressure being greater than that necessary to perfect the bond between the laminae. For sewing through a bonded joint see subclass 93 above.

(2) Note. Operations necessary to the formation of the sandwich are heating, applying adhesive and applying pressure to an assembly of laminae to perfect the bond. These steps are not considered to fall within the scope of "combined" and are provided for below.

(3) Note. See section "B. Laminating Combined With Other Operations" of the class definition of this class for the lines with other classes and the locus of patents relating to laminating combined with other operations.

SEE OR SEARCH THIS CLASS, SUBCLASS:
93, and see (1) Note above.

282 This subclass is indented under subclass 60. Processes in which the lamina is subjected to the application of heat to one portion of the surface area thereof while simultaneously cooling another portion of the surface area.

283 This subclass is indented under subclass 60. Processes in which the bonding agent is applied to the adhering face of at least one of the laminae in a dry particulate state.

(1) Note. Included in this and indented subclasses are bonding materials which are in the form of granules, pellets, beads, flakes, platelets or powdered state and are not dispersed in a liquid medium.

SEE OR SEARCH THIS CLASS, SUBCLASS:
279, for the mass application of nonadhesive particles to laminae.

SEE OR SEARCH CLASS:
427, Coating Processes, subclasses 180+ for coating processes wherein solid particles or fibers are applied.

284 This subclass is indented under subclass 283. Processes in which a liquid is applied to the particles to render said particles tacky, said liquid being applied subsequent to the application of the particulate material.

285 This subclass is indented under subclass 60. Processes in which (1) pressure less than atmospheric is applied to the work during the association of the laminae or (2) where a force is exerted by a fluent medium directly onto the work during association of the laminae.

(1) Note. The reduced pressure or the fluid pressure may be applied to bring the lamina into contact or to effect more intimate contact of the laminae.

SEE OR SEARCH THIS CLASS, SUBCLASS:
104, for the evacuation of air during the making of optically transparent glass sandwiches.
381+, for evacuated or fluid pressure chamber enclosing the work.

286 This subclass is indented under subclass 285. Processes in which air is removed from between the assembled laminae by vacuum or fluid pressure.

SEE OR SEARCH CLASS:
100, Presses, subclass 90 for presses with means to remove air from material while being pressed.

287 This subclass is indented under subclass 285. Processes in which fluid pressure or vacuum is applied to an element covering the inner surface of a cavity that is at least partially enclosed.

288 This subclass is indented under subclass 60. Processes in which a force is exerted simultaneously upon a plurality of independent assemblies or separate sandwiches which are not bonded one to the other.

(1) Note. The separate sandwiches may be in a stacked relationship, in a noncontacting arrangement or in other type of relationship during the simultaneous application of pressure to the several sandwiches.

289 This subclass is indented under subclass 60. Processes in which a bond inhibiting material is used to prevent adhesion between laminae in areas that might otherwise bond in the absence of the material.

(1) Note. The parting or release material may be in the form of a film or powder.

SEE OR SEARCH THIS CLASS, SUBCLASS:
90, for processes using a barrier layer to prevent migration or bleeding between laminae.
323, for processes utilizing a subsequently removed flexible element interposed between the work and the pressure surface.

SEE OR SEARCH CLASS:
428, Stock Material or Miscellaneous Articles, subclasses 40.1+, for a composite stock material product having a layer of adhesive and a covering

therefor which must be removed or stripped to expose the adhesive and enable it to be adhered to a surface; subclass 352 for a composite stock material having an adhesive outermost surface and also having a release or anti-stick coating (usually on the surface opposite the adhesive surface).

290 This subclass is indented under subclass 60. Processes in which superposed laminae touching each other at all points are adhered to each other at a plurality of spaced noncontiguous areas.

SEE OR SEARCH CLASS:
428, Stock Material or Miscellaneous Articles, for a composite stock material product in which components are secured together by a discontinuous or differential coating, impregnation or bond.

291 This subclass is indented under subclass 290. Processes in which the laminae are secured at spaced areas by an applied adhesive, the adhesive being applied at the spaced secured areas only.

SEE OR SEARCH CLASS:
427, Coating Processes, subclasses 256+ for processes of forming nonuniform coatings.

292 This subclass is indented under subclass 60. Processes directed to bonding at least two contacting laminae which have opposed portions out of contact or spaced from each other.

(1) Note. This subclass includes processes directed to adhering two hemispheres together to form a sphere and applying a flat lamina to the apexes of an already embossed lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
197, for processes of permanently bending or reshaping self-sustaining laminae by separating laminae between spaced secured areas.
210, for processes of forming an undulated sheet and securing said sheet to a base with parts of the shaped areas out of contact.

SEE OR SEARCH CLASS:
65, Glass Manufacturing, subclass 58 for a process of bonding a glass part to a preformed part by a glassworking operation, where the parts have opposed facing areas out of contact.

293 This subclass is indented under subclass 60. Processes in which an element is put into an opening or recess in a lamina and is bonded to an internal surface of the opening.

SEE OR SEARCH THIS CLASS, SUBCLASS:
98, for repairing processes involving a step of replacing a defective area of a part by inserting a new piece in the aperture left by the removal of the defective area.

294 This subclass is indented under subclass 293. Processes directed to telescoping a tube or rod-like member within a tubular body.

295 This subclass is indented under subclass 60. Processes directed to applying an adhesive to a restricted area of a lamina and subsequent to assembly applying an external force to the assembly to cause the adhesive to cover a greater area of the lamina.

296 This subclass is indented under subclass 60. Processes for bonding individual laminae of finite length and being of great length relative to cross-section and of relatively regular cross-section.

SEE OR SEARCH THIS CLASS, SUBCLASS:
166+, for processes for bonding flexible filamentary material while in indefinite or running length.

SEE OR SEARCH CLASS:
162, Paper Making and Fiber Liberation, appropriate subclasses for a processes of manufacturing a fibrous web by a process which includes water laying. The web may be held together by adhesive forces stemming from an extraneously applied material or from

a component or property inherent in the fiber.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 109+ for a process of manufacturing an article, e.g., a web, from staple-length nonmetal fibers by a process which excludes a water-laying step.

419, Powder Metallurgy Processes, appropriate subclasses for methods of making articles from particulate metal-containing materials using pressure, with or without heat.

297 This subclass is indented under subclass 60. Processes in which at least two separate and distinct elements are individually and separately directly united to the same surface of another lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:

560+, for apparatus for uniting plural discrete elements to a single base.

298 This subclass is indented under subclass 297. Processes in which at least two of the plural discrete laminae or a portion thereof are forced into the surface to which they are bonded.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 432+ for a method including a step of piercing one part by another, e.g., stapling or nailing.

428, Stock Material or Miscellaneous Articles, subclass 614 for metallic stock material comprising one component embedded in another component.

299 This subclass is indented under subclass 297. Processes in which all laminae including the discrete laminae are parallel to each other and each surface thereof has an even plane surface.

300 This subclass is indented under subclass 299. Processes directed to superposing at least one additional lamina over the discrete laminae.

301 This subclass is indented under subclass 300. Processes in which the discrete laminae are applied to a continuously moving web of indefinite length and thereafter superposing on the discrete laminae another continuously moving web of indefinite length.

302 This subclass is indented under subclass 299. Processes in which the plural discrete laminae are applied to a continuously moving web of indefinite length.

303 This subclass is indented under subclass 302. Processes in which the discrete laminae are supplied to the indefinite length web from a plurality of different sources.

303.1 This subclass is indented under subclass 60. Processes which include inserting a solid element into the surface of a preformed plastic body with no reshaping of the plastic body other than that which is caused by displacement of material due to the insertion of the solid element.

(1) Note. Patents in which localized plastic reshaping occurs due to displacement of material in the area where the part is inserted are included here unless the plastic reshaping is caused by a member other than the part being inserted. For patents in which the plastic body is simultaneously shaped by a mold element see the search notes to Class 264 below.

(2) Note. The preform or the plastic part may or may not be heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

91+, for mechanical joining combined with laminating.

293, for patents in which the preform is inserted into the recess of the plastic part.

298, for patents in which multiple preforms are inserted into the plastic part.

SEE OR SEARCH CLASS:

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 271.1+ for inserting a preform part into a plastic body and simultaneously reshaping the body with a mold element.

304.1 Butt edge joining of laminae:
This subclass is indented under subclass 60. Processes directed to uniting laminae edge to edge without overlapping of the edges.

(1) Note. The butt joint may be reinforced by applying thereto a tape or additional strengthening element.

SEE OR SEARCH THIS CLASS, SUBCLASS:
49, for processes of joining indefinite length conductors end to end.
157, for processes of joining indefinite length laminae end to end.
502+, for apparatus for joining indefinite length laminae end to end.
544+, for apparatus for joining indefinite length laminae edge to edge.

304.2 Joining of nonplanar elements; e.g., configured hollow objects, etc.:
This subclass is indented under subclass 304.1. Processes directed to uniting laminae edge to edge wherein the lamina are nonplanar.

(1) Note. Included herein are processes of joining corrugated lamina and processes of assembly of containers or other finite length hollow elements.

SEE OR SEARCH THIS CLASS, SUBCLASS:
296, for processes of joining tubes or filaments of indefinite length.

304.3 With joiner member or reinforcement:
This subclass is indented under subclass 304.1. Processes directed to joining laminae edge to edge wherein an additional member is applied to add mechanical strength to the joint.

304.4 Carpet or fabric joined:
This subclass is indented under subclass 304.3. Processes directed to the process of joining carpeting or fabric edge to edge and which utilize a reinforcement of the joint area.

(1) Note. Typically the reinforcement is a tape.

304.5 With preliminary edge treatment or joining of edges of irregular shape; e.g., tongue and groove, beveled, etc.:
This subclass is indented under subclass 304.1. Processes in which prior to joining the edges are physically or chemically treated to perfect the joining operation or in which the edges are nonplanar or are not perpendicular to the face of other the lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
258, for processes of edge treatment by cutting.

304.6 By heat:
This subclass is indented under subclass 304.1. Processes directed to the edge to edge joining of lamina including the use of increased temperature to effect joining.

SEE OR SEARCH CLASS:
219, Electric Heating, subclasses 101+ for the butt joining of metal by means of pressure while heating by an electric current.

304.7 Of carpet or fabric:
This subclass is indented under subclass 304.1. Processes in which the lamina joined is carpeting or fabric.

305 This subclass is indented under subclass 60. Processes in which bonding is effected after assembly of the laminae by subsequent application thereto of the adhesive, per se, or a solvent or other chemical activating agent to render tacky or adhesive the uncoated or coated contacting facing surfaces.

SEE OR SEARCH THIS CLASS, SUBCLASS:
278+, for processes for coating the nonadhering face of a lamina.

SEE OR SEARCH CLASS:
162, Paper Making and Fiber Liberation, appropriate subclasses for a process of manufacturing a fibrous web which includes water laying and the addition of an extraneous binder or activator to the web while still wet.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 109+ for a process of manufacturing an article, e.g., a web, from staple-length fibers by a process which excludes a water-laying step, especially subclass 128 for the addition of a liquid binder subsequent to fiber assembly.

306.3 By pressure or drying only, without tack; e.g., for easy delamination, etc.:

This subclass is indented under subclass 60. Subject matter wherein a bond, often temporary, between two laminae is accomplished by pressing the laminae together without an adhesive and without developing tack in either lamina, or by merely assembling the laminae and drying the laminate in assembled condition.

(1) Note. Usually the bonding is performed at ambient temperatures.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 428+ for an assembly and/or joining process involving mechanical interlocking of parts or of a mechanical fastener.

306.6 Using single, preformed, diverse bonding lamina between other laminae:

This subclass is indented under subclass 60. Subject matter wherein a laminate having at least three plies is assembled, an inner lamina being a self-sustaining sheet composed of a single lamina which is tackified in the process to bond the outer laminae together, the inner lamina having a composition different from either of the outer laminae.

SEE OR SEARCH THIS CLASS, SUBCLASS:

305, for a process in which a bonding sheet is applied to the outside of laminae to be bonded.

313, for a laminating process which uses an intermediate laminae, e.g., a coated substrate, as a bonding sheet between uncoated laminae.

325+, for a process which uses a particular adhesive for bonding two or more laminae to obtain a particular three-or-more layered product, wherein the adhesive is introduced to the process as other than a self-sustaining sheet.

306.9 Including curing of nonfully polymerized material:

This subclass is indented under subclass 306.6. Subject matter wherein the bonding process includes a chemical reaction in which molecules are united to produce material of higher molecular weight than the starting material.

(1) Note. The reaction may be the polymerization of a monomer, chain-extension or cross-linking of an intermediate polymer, etc.

(2) Note. When the word "curing" is used it is assumed that cross-linking takes place.

(3) Note. The cross-linking phenomenon may involve reaction with functional groups forming a part of the "outside" laminae to be bonded.

307.1 By curing of nonfully polymerized self-sustaining lamina:

This subclass is indented under subclass 60. Subject matter wherein at least one of the self-sustaining laminae to be bonded has not been completely polymerized, that is, it contains reactable functional groups, and the bonding process includes a chemical reaction in which such groups are reacted to form molecules of higher weight than the starting material. The reaction takes place within the lamina to be bonded or involves the uniting of the aforementioned functional groups with functional groups of another lamina to be bonded or of another substance which is between the laminae.

(1) Note. Exemplary of functional groups in a lamina are the olefinic double bonds of natural rubber, the free hydroxyl groups remaining in a cellulose-partial acetate ester, hydrous oxide groups on the surface of a metal, etc.

(2) Note. The reaction may be one in which a monomeric material is polymerized or in which an intermediate polymer is cross-linked, chain-extended, etc.

(3) Note. When the word "curing" is used, it is assumed that cross-linking takes place.

(4) Note. A cross-linking reaction generally produces a so-called "thermoset" bond which is no longer susceptible to softening by heat.

(5) Note. This subclass is limited to those processes in which at least some polymerization takes place at the time of bonding; final curing (e.g., of a coating, etc.) before assembly is not covered by this subclass.

(6) Note. Curing of an adhesive only, between the laminae to be bonded, after assembly of the sandwich, without the involvement of functional groups in a lamina to be bonded, is not covered by this subclass. See subclasses 325+.

307.3 With coating or impregnating a face to be adhered:

This subclass is indented under subclass 307.1. Subject matter wherein at least one lamina to be bonded is treated with a material which penetrates the lamina at least in part or which forms a coating on a face to be adhered.

(1) Note. The coating need not be applied as a liquid or particulate solid but may be a gaseous treating agent which reacts with the substance of the lamina to form a so-called "reaction coating".

SEE OR SEARCH THIS CLASS, SUBCLASS:

182, for a process of binding in which an intermediate laminate, (e.g., a coated substrate, etc.), is bonded to another laminate by completing polymerization, e.g., vulcanization, between the intermediate laminates.

278+, for a process in which a nonadherent face of a lamina is coated.

307.4 Indefinite plurality of similar impregnated thin sheets; e.g., "decorative laminate" type, etc.:

This subclass is indented under subclass 307.3. Subject matter wherein an unspecified number, greater than two, of sheets are bonded together by curing, each sheet being of similar material to the others and having at least one negligible dimension, each sheet having been impregnated with a fluid material before or after assembly of the stack.

(1) Note. The products usually are "decorative laminates" such as are used for counter tops, dishes, etc., sold under trade names such as Formica, Melmac, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

330.9+, for other bonding processes using melamine-derived resins.

307.5 Coating solidified; e.g., by drying, etc., before assembly:

This subclass is indented under subclass 307.3. Subject matter in which the material in or on the lamina develops the properties of a solid before being assembled with another lamina.

307.7 Including uncurable lamina; e.g., metal, paper, etc.:

This subclass is indented under subclass 307.1. Subject matter wherein one of the laminae to be bonded has no functional groups available for chemical reaction internally or with a lamina bonded to it in the process.

308.2 By tackifying substance of self-sustaining lamina to be bonded; e.g., autogenous bonding, etc.:

This subclass is indented under subclass 60. Subject matter wherein bonding is achieved without use of an extraneous adhesive material by making a portion of a lamina which is to be bonded, per se, tacky.

(1) Note. Tackiness is usually achieved by heat or by a swelling or solvent action.

(2) Note. Subject matter for this subclass includes autogenous bonding of a fibrous web to another lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:

166+, especially, subclass 181, for autogenous bonding of filaments of indefinite length or in the form of running lengths, to each other, to form a web.

182, for a bonding process in which one laminate (e.g., a coated substrate, etc.) is bonded to another laminate by tackifying a single lamina of one or both of the intermediate laminates.

324.4, for a process in which a single lamina, e.g., a coating, etc., of an intermediate laminate, e.g., a coated substrate, etc., is tackified for bonding to another lamina.

SEE OR SEARCH CLASS:

162, Paper Making and Fiber Liberation, appropriate subclasses for a process of manufacturing a fibrous web by a process which include water laying. The web may be held together by adhesive forces stemming from an extraneously applied material or from a component or property inherent in the fiber.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 109+ for a process of manufacturing an article, e.g., a web, for staple-length fibers by a process which excludes a water-laying step, but which may include autogenous bonding. See subclasses 123+.

308.4 Only part of contacting laminae surfaces bonded; e.g., seam, seal, etc.:

This subclass is indented under subclass 308.2. Subject matter wherein precautions are taken to prevent bonding of contacting laminae surfaces at other than selected contacting areas, usually by restricting heat and/or pressure and/or solvent applications to the selected areas.

308.6 With treating agent application to a surface:

This subclass is indented under subclass 308.2. Subject matter wherein a gaseous or liquid agent is applied to a surface to be bonded to improve the bonding properties of the surface.

(1) Note. Usually the added agent is a solvent which tackifies the surface to be bonded.

(2) Note. The process need not include a step of removing the treating agent.

SEE OR SEARCH THIS CLASS, SUBCLASS:

155, for a bonding process which includes a step of removing a transitory solid material.

281, for a bonding procedure which includes a step which, per se, is provided for in another patent class, e.g., cleaning, etc.

305, for a bonding process which includes adding a treating agent to a laminate after assembly.

308.8 Plural agents applied sequentially or to different laminae or using water as sole agent:

This subclass is indented under subclass 308.6. Subject matter wherein water is the sole agent used to cause tackiness or in which more than one of the laminae to be bonded are treated with different agents or in which a single lamina is treated with an agent and then treated with another agent.

(1) Note. The water may be applied as vapor or steam and its purposes may be to heat a lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:

306.3, for a process of adhering laminae where water may be used, but in which the water causes no tackiness.

309.3 Diverse laminae:

This subclass is indented under subclass 308.6. Subject matter in which one lamina to be bonded has a composition different from another lamina to be bonded.

309.6 Involving defined plastic flow or melting of entire lamina:

This subclass is indented under subclass 308.2. Subject matter wherein the bonding process includes a specified flowing or movement of tackified interfacial lamina material or the melting of an entire lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:

196+, for a bonding process which includes permanent bending or reshaping or surface deformation of a self-sustaining lamina.

306.6+, for a bonding process wherein a self-sustaining bonding sheet, different from and placed between other laminae, is completely melted to bond the other laminae.

309.9 With heating or lamina prior to assembly: This subclass is indented under subclass 308.2. Subject matter wherein a lamina is heated to tackifying temperature before it is assembled with the lamina to which it is to be bonded.

SEE OR SEARCH THIS CLASS, SUBCLASS:

322, for adhesive bonding processes in general wherein a lamina is heated before the application of adhesive.

310 This subclass is indented under subclass 60. Processes wherein each facing surface of the laminae to be joined is coated with a material which differs in composition from the other.

(1) Note. Of the different coatings employed in this subclass, one may be a primer for one lamina face and the adhesive applied to the other, or, two different reactants may be employed, one on each opposing face, which, after contact of the laminae, form the adhesive by reaction thereof, in situ.

SEE OR SEARCH THIS CLASS, SUBCLASS:

314+, for processes of applying a plurality of different coatings to the same facing surface of one of the laminae.

311 This subclass is indented under subclass 60. Processes which include the step of heating and cooling in any sequence during the interval in which the laminating pressure is being maintained.

SEE OR SEARCH THIS CLASS, SUBCLASS:

80, for laminating processes which include a refrigeration or freezing step.

312 This subclass is indented under subclass 60. Processes in which the laminating pressure applied varies stepwise in intensity or is applied intermittently or sequentially during the laminating step.

(1) Note. The step of subjecting a lamina to continuously increasing pressure is not considered sequential different pressure applying for this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

103, for plural sequential pressures applied in optically transparent glass sandwich making.

313 This subclass is indented under subclass 60. Processes directed to interposing an intermediate laminate of at least two layers, e.g., a coated lamina, etc. between noncoated outer laminae.

SEE OR SEARCH THIS CLASS, SUBCLASS:

106, for processes wherein a preformed adhesive layer is employed in making glass sandwiches.

306.6, for a bonding process which uses a single, preformed, diverse self-sustaining bonding lamina (which may be an impregnated material) between other laminae.

SEE OR SEARCH CLASS:

162, Paper Making and Fiber Liberation, subclass 104 and 123 for processes involving waterlaid paper webs.

314 This subclass is indented under subclass 60. Processes wherein the adhering face of at least one lamina is treated one after the other with at least two different liquids or liquefiable materials.

(1) Note. See Class 520, Synthetic Resins or Natural Rubbers, subclasses 1+ for a

statement of material proper for Class 520.

(2) Note. The use of water or other agent for the mere purpose of a preliminary washing or cleaning is not sufficient to place a patent in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
310, for processes in which each of the facing surfaces of the laminae is coated, the two coatings being of dissimilar material.

SEE OR SEARCH CLASS:
427, Coating Processes, subclasses 402+ for processes of applying superposed diverse coatings, or coating a coated base.

315 This subclass is indented under subclass 314. Processes wherein at least two of the sequential liquids are natural or synthetic rubber and/or natural or synthetic resin containing only liquefiable material.

316 This subclass is indented under subclass 314. Processes wherein the first treatment of the adhering surface is with an acidic or acid containing liquid or liquefiable acidic material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
2+, for etching processes in which an acidic material may be used as an etchant, particularly subclass 3 for etching combined with a laminating step.

317 This subclass is indented under subclass 314. Processes in which at least one liquid or liquefiable material is a protein containing liquid.

(1) Note. Proteins are a group of nitrogenous organic compounds of high molecular weight which yield amino acids on hydrolysis, e.g., casein, animal glue, albumin, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
328, and 336, for adhesives which contain proteinaceous materials.

318 This subclass is indented under subclass 314. Processes in which at least one liquid is a carbohydrate containing liquid or carbohydrate containing liquefiable material.

(1) Note. Carbohydrates are organic compounds such as are synthesized by plants of the general formula $C_x(H_2O)_y$, e.g., starches, sugars, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
328, and 336, for adhesives which contain carbohydrate materials.

319 This subclass is indented under subclass 314. Processes in which at least one liquid or liquefiable material is composed of inorganic constituents only.

(1) Note. See note to subclass 314 above relative to the use of water as a washing agent only.

320 This subclass is indented under subclass 60. Processes in which a dry nontacky coating of adhesive on at least one facing surface of the laminae to be united is heated prior to assembly contact thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
306+, for autogenous bonding wherein one or both adhering surfaces may be heated prior to assembly.
313, for processes wherein a coated adhesive carrier is interposed between two outer laminae.

321 This subclass is indented under subclass 60. Processes wherein one lamina is heated prior to assembly and the heat from the lamina is utilized to heat the dry adhesive on the opposed lamina.

322 This subclass is indented under subclass 60. Processes wherein the lamina is heated after coating with adhesive but prior to assembly, or wherein the lamina or base is heated prior to application of the adhesive.

SEE OR SEARCH THIS CLASS, SUBCLASS:

306, for autogenous bonding which may involve heating of one or more laminae prior to assembly.

323 This subclass is indented under subclass 60. Processes in which a removable flexible and/or resilient element is placed between the laminae to be bonded and pressure means employed.

(1) Note. This subclass takes, for example, those laminating steps in which the laminae are enclosed in a cellophane bag which protects the pressure means from extruded resin, or where pressure is transmitted through a resilient layer for desired effects.

SEE OR SEARCH THIS CLASS, SUBCLASS:

90, for barrier layers which are employed to prevent migration or bleeding between laminae.

288, for processes of making plural sandwiches simultaneously wherein a nonadhesive separatory layer or element is employed between sandwiches.

289, for processes in which a parting or release material is employed to prevent adhesion.

324 This subclass is indented under subclass 60. Processes which provide for lamination of running webs or sheets or those of indefinite length in a continuous operation.

(1) Note. See section III of the class definition of this class for the definition of indefinite length work.

SEE OR SEARCH CLASS:

162, Paper Making and Fiber Liberation, subclass 104 and 123+ for processes wherein waterlaid paper webs are employed.

324.4 By tackifying a single lamina of intermediate laminate:

This subclass is indented under subclass 60. Subject matter wherein an intermediate laminate, e.g., a coated substrate, is bonded to a single lamina by tackifying a single lamina of the intermediate laminate.

SEE OR SEARCH THIS CLASS, SUBCLASS:

182, for a process of bonding two intermediate laminates.

325 This subclass is indented under subclass 60. Processes in which the adhesive employed is specifically named or identified by composition thereof or chemical structure.

(1) Note. Patents in this and indented subclasses provide for use of specifically identified adhesives in a laminating operation involving no manipulative step provided for above. Individual compounds and compositions, per se, which may be disclosed to possess adhesive utility are classified on the basis of chemical structure or ingredients therein in Class 106, Compositions: Coating or Plastic, Class 260, Chemistry of Carbon Compounds and Class 423, Chemistry of Inorganic Compounds. Patents from these and other composition classes may be cross-referenced into these subclasses where a laminating process is claimed or where a specific example in the specification is limited to laminating. The mere reference in the specification to the effect that a composition is a good adhesive is not sufficient to place a cross-reference in these subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

283+, for adhesives which are applied in particulate form.

309, for preformed intermediate layers or laminae which may be disclosed to have utility as a bonding agent between other dissimilar laminae.

SEE OR SEARCH CLASS:

424, Drug, Bio-Affecting and Body Treating Compositions, subclass 77 for an adhesive trapping composition.

428, Stock Material or Miscellaneous Articles, appropriate subclasses for a stock material product in the form of

composite web or sheet, including a particular adhesive, and especially subclasses 355+ where the adhesive is the outermost layer and subclasses 411.1+ which provide for nonstructural plural layer products categorized by the composition of the respective layers, the adhesive employed between layers being considered as one of the layers.

326 This subclass is indented under subclass 325. Adhesives which contain or consist of organic compounds.

(1) Note. Attention is directed to the definition of Class 260, Chemistry of Carbon Compounds, for the scope of the term "organic compounds" and of the various types of organic compounds provided for in the subclasses indented thereunder as well as for the scope of such terms as rubber, for which see specifically Class 520, Synthetic Resins or Natural Rubbers and the search notes thereto.

SEE OR SEARCH CLASS:
106, Compositions: Coating or Plastic, appropriate subclass for coating and plastic compositions which do not contain synthetic resins and which may be disclosed to possess adhesive utility.

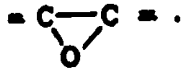
327 This subclass is indented under subclass 326. Adhesives which are resinous materials produced synthetically.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, subclasses 1+ for an explanation of the type of polymer which is proper for Class 520.

328 This subclass is indented under subclass 327. Resins which also contain as an added ingredient carbohydrate and/or protein ingredients or derivatives thereof.

329 This subclass is indented under subclass 327. Resins which contain silicon.

330 This subclass is indented under subclass 327. Resins which contain epoxy or oxirane groups or are reaction products of compounds having epoxy or oxirane groups, that is containing the triatomic ring



330.9 Nitrogenous resin:
This subclass is indented under subclass 327. Subject matter wherein the resin adhesive contains nitrogen.

331.1 With polymerization completion, i.e., curing, after assembly:
This subclass is indented under subclass 330.9. Subject matter wherein the adhesive is applied in a nonfully polymerized state and after assembly the sandwich is exposed to a condition, e.g., heat, air, water, etc., sufficient to increase the molecular weight of at least some resin component by reaction of functional groups contained therein.

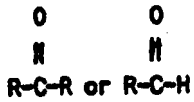
SEE OR SEARCH THIS CLASS, SUBCLASS:
307.1+, and 309.6, for processes in which an incompletely polymerized self-sustaining lamina is bonded by curing.

331.2 N only in unlinked side-chain or side-ring:
This subclass is indented under subclass 331.1. Subject matter wherein the finished (e.g., cured, etc.) resin adhesive has a polymer backbone free of nitrogen, the nitrogen being found only in side-chains (e.g., polyacrylonitrile, etc.) or in side-rings (e.g., polyvinylpyridine, etc.) which are not cross-linked to other polymer backbone material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
331.6, for bonding processes using similar adhesive but without curing after assembly.

327, 333 and 334, for bonding processes using other vinyl-type resins.

331.3 Derived from aldehyde or ketone:
This subclass is indented under subclass 331.1. Subject matter wherein the curing or the preparation of the prefinal-polymer involves the reaction of an moiety.



SEE OR SEARCH THIS CLASS, SUBCLASS:
307.4, for the use of aldehyde-type resins, such as urea-aldehyde resins or melamine-aldehyde resins in "decorative laminate" manufacture involving the impregnation of thin sheets followed by assembling a stack of sheets and curing.

331.4 Iso- or thio-cyanate moiety reacted in curing:
This subclass is indented under subclass 331.1. Subject matter wherein a -N=C=O or -N=C=S moiety in the resin precursor is destroyed in the curing.

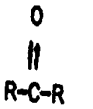
331.5 N in a ring:
This subclass is indented under subclass 331.1. Subject matter wherein the resin precursor contains a cyclic moiety and the cyclic moiety contains nitrogen.

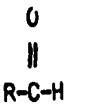
331.6 N only in unlinked side-chain or side-ring; e.g., polyvinyl pyridine, etc.:
This subclass is indented under subclass 330.9. Subject matter wherein the resin adhesive has a polymer backbone free of nitrogen, the nitrogen being found only in side-chains (e.g., polyacrylonitrile, etc.) or in side-rings (e.g., polyvinyl pyridine, etc.) which are not cross-linked to other polymer backbone material.

331.7 Derived from iso- or thio-cyanate; e.g., polyurethane, etc.:
This subclass is indented under subclass 330.9. Subject matter wherein the resin has been prepared from a starting material or intermediate containing the -N-C=O or -N=C=S moiety.

331.8 Derived from acyclic compound containing N:
This subclass is indented under subclass 330.9. Subject matter wherein the resin has been prepared from a starting material or intermediate free from cyclic moieties and containing nitrogen.

331.9 And aldehyde ketone or carbocyclic moiety-containing compound:
This subclass is indented under subclass 331.8. Subject matter wherein the resin has been prepared from the acyclic nitrogenous compound and from a starting material or intermediate that contains a carbocyclic ring, a ketone group, or an aldehyde group.

 moiety, an

 moiety or a ring containing carbon atoms only.

332 This subclass is indented under subclass 327. Resins which contain polycarboxylic ester groups.

(1) Note. This subclass includes such resins as the alkyds, i.e., those formed from the reaction of polybasic acids, such as terephthalic acid, and glycols, and those formed by polymerization of unsaturated mono-esters such as methyl acrylate and vinyl acetate.

333 This subclass is indented under subclass 327. Resins which contain at least some halogenated hydrocarbon.

(1) Note. Synthetic rubber-like materials which are halogenated hydrocarbons are included herein, e.g., neoprene or other polymers of chloroprene, polyvinyl chloride.

334 This subclass is indented under subclass 327. Resins which are hydrocarbon resin containing.

(1) Note. Included herein are materials such as butadiene-styrene polymers and polyethylene.

335 This subclass is indented under subclass 327. Resins which contain phenol-aldehyde reaction products.

336 This subclass is indented under subclass 326. Adhesives which contain protein and/or carbohydrate and derivatives thereof.

(1) Note. Animal glue and starch pastes are examples of proteins and carbohydrate adhesives, respectively, within the scope of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
328, for adhesive compositions which include both synthetic resins and a carbohydrate and/or protein.

337 This subclass is indented under subclass 326. Adhesives which contain bituminous products.

(1) Note. The term bituminous includes such materials as asphalt and other tarry residues from petroleum or coal origin.

SEE OR SEARCH CLASS:
106, Compositions: Coating or Plastic, subclasses 273+ for bituminous containing compositions which may be disclosed to have utility as adhesives.
520, Synthetic Resins or Natural Rubbers, Class 523, subclass 450 and 518, and Class 524, subclasses 59+ and 705 for nonreactant bituminous material admixed with a synthetic resin or natural rubbers and which composition may be disclosed to have utility as an adhesive.

338 This subclass is indented under subclass 326. Adhesives which contain natural rubber.

(1) Note. Various synthetic resins are rubbery materials and these compositions are classified hereinabove (subclasses 327+) or in such classes as Class 520, Synthetic Resins or Natural Rubbers, subclass 1 and indented classes thereunder, on the basis of ingredients or reactants contained therein.

SEE OR SEARCH CLASS:
260, Chemistry of Carbon Compounds, subclasses 709+ for natural rubber and compositions thereof, which may be disclosed to have adhesive utility.

344 This subclass is indented under subclass 1. Processes directed to separating at least one adhered layer or portion thereof from another layer at their bonding faces, per se, in which the layer retains its identity during separation.

(1) Note. Processes for the separation of laminae in which a lamina is destroyed are generally classified in that class which provides for the operation, per se. Thus, for example, destroying a lamina by abrading will be found in Class 451 Abrading; by cutting, in Class 83, Cutting, appropriate subclasses, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
247, for processes of delaminating combined with an assembly and/or joining operation.
584, for delaminating apparatus.

SEE OR SEARCH CLASS:
83, Cutting, appropriate subclasses, and see (1) Note above.
427, Coating Processes, appropriate subclasses, for removing portions of a layer applied as a coating composition. Processes of removing portions of a layer applied as a coating composition not combined with a coating step are classified in this class (156).
451, Abrading, for an abrading process in general, and see the (1) Note above.

345.1 DIFFERENTIAL FLUID ETCHING APPARATUS:
This subclass is indented under the class definition. . Apparatus under the class definition for contacting a workpiece with a reactive fluid to chemically erode different portions of the workpiece at different rates.

(1) Note. The term "workpiece" herein used to indicate the material being chemically eroded, or etched. The art often uses terms such as "base" and "substrate" to mean substantially the same as "workpiece" .

SEE OR SEARCH CLASS:
118, Coating Apparatus, subclasses 715 through 733 for similar devices used to coat a base.
134, Cleaning and Liquid Contact With Solids, appropriate subclasses for etching apparatus in general.
204, Chemistry, Electrical and Wave Energy, subclasses 298.31 through 298.39 for electrolytic etching apparatus.

345.11 For liquid etchant:
This subclass is indented under subclass 345.1. Apparatus including means for etching a workpiece with a liquid etchant.

345.12 With mechanical polishing (i.e., CMP-chemical mechanical polishing):
This subclass is indented under subclass 345.11. Apparatus including means for carrying out combined chemical etching and mechanical abrading to polish a workpiece.

SEE OR SEARCH CLASS:
451, Abrading, appropriate subclasses for similar mechanical polishing devices without liquid etchants.

345.13 With measuring, sensing, detection or process control means:
This subclass is indented under subclass 345.12. Apparatus including means to measure, sense, or detect a process condition, or to automatically control the operation of the apparatus.

345.14 With wafer retaining ring:
This subclass is indented under subclass 345.12. Apparatus including a ring-shaped member for securing a disk-shaped workpiece against movement while the workpiece is etched.

345.15 With measuring, sensing, detection or process control means:
This subclass is indented under subclass 345.11. Apparatus including means to measure, sense, or detect a process condition, or to automatically control the operation of the apparatus.

345.16 With endpoint detection means:
This subclass is indented under subclass 345.15. Apparatus including means to detect when a desired end of the etching has been reached.

345.17 Liquid etchant spray means:
This subclass is indented under subclass 345.15. Apparatus including means to spray a liquid etchant upon the workpiece.

345.18 With means to supply, remove, or recycle liquid etchant outside of etching tank or chamber (e.g. supply tanks or pipe network):
This subclass is indented under subclass 345.11. Apparatus including means located outside an etching tank or chamber to supply etchant to the tank or chamber, to remove used etchant from the tank or chamber, or to recycle used etchant.

345.19 With mechanical mask or shield or shutter for shielding workpiece:
This subclass is indented under subclass 345.11. Apparatus including a mask, shield, or shutter for preventing the liquid etchant from contacting a particular portion of the workpiece.

345.2 Running length workpiece (e.g. etching indeterminate length strip):
This subclass is indented under subclass 345.11. Apparatus including means to etch a longitudinally continuous workpiece of indeterminate length, e.g., a strip.

345.21 Liquid etchant spray type:
This subclass is indented under subclass 345.11. Apparatus including means to spray a liquid etchant upon the workpiece.

345.22 With plural etching zones for a single discrete workpiece in apparatus:
This subclass is indented under subclass 345.11. Apparatus including means to carry out plural discrete etchings of the workpiece in separately located zones within the apparatus.

345.23 With specified workpiece support:
This subclass is indented under subclass 345.11. Apparatus including a means to hold the workpiece to be etched; to be "specified" , the means must be heated, cooled, moveable, or structurally defined.

345.24 With measuring, sensing, detection or process control means:
This subclass is indented under subclass 345.1. Apparatus including means to measure, sense, or detect a process condition, or to automatically control the operation of the apparatus.

345.25 For endpoint detection:
This subclass is indented under subclass 345.24. Apparatus wherein the means is for detecting when a desired end of the etching has been reached.

345.26 For detection or control of pressure or flow of etchant gas:
This subclass is indented under subclass 345.24. Apparatus wherein the means is for measuring, sensing, detecting, or controlling pressure or flow rate of an etchant gas.

345.27 For temperature detection or control:
This subclass is indented under subclass 345.24. Apparatus wherein the means is for measuring, sensing, detecting, or controlling temperature within the apparatus or within some portion thereof.

345.28 For detection or control of electrical parameter (e.g. current, voltage, resistance, power, etc.):
This subclass is indented under subclass 345.24. Apparatus wherein the means is for measuring, sensing, detecting, or controlling an electrical parameter within the apparatus or within some portion thereof.

345.29 With etchant gas supply or exhaust structure located outside of etching chamber (e.g. supply tank, pipe network, exhaust pump, particle filter):
This subclass is indented under subclass 345.1. Apparatus including a structurally defined means located outside an etching chamber for the supply or removal of an etchant gas to the chamber.

345.3 With mechanical mask, shield or shutter for shielding workpiece:
This subclass is indented under subclass 345.1. Apparatus including a mask, shield, or shutter for preventing the etchant from contacting a particular portion of the workpiece.

345.31 With means for passing discrete workpiece through plural chambers (e.g. loadlock):
This subclass is indented under subclass 345.1. Apparatus including means to pass a single workpiece through a plurality of separate treatment or vacuum chambers.

345.32 With robot arm connected by doors to plural other chambers (i.e. cluster tool):
This subclass is indented under subclass 345.31. Apparatus wherein the means for passing is a movable articulated arm connected by doors to a plurality of chambers.

345.33 With gas inlet structure (e.g. inlet nozzle, gas distributor):
This subclass is indented under subclass 345.1. Apparatus including a structurally defined means located inside an etching chamber for the introduction and dispersal of an etchant gas into the body of the chamber.

345.34 Showerhead-type:
This subclass is indented under subclass 345.33. Apparatus wherein the gas inlet includes a substantially flat plate with a plurality of gas-passing through-holes therein.

345.35 With plasma generation means remote from processing chamber:
This subclass is indented under subclass 345.1. Apparatus including means, external to the processing (etching) chamber, for generating a plasma.

345.36 By microwave:
This subclass is indented under subclass 345.35. Apparatus wherein the plasma is generated by microwave excitation of a gas.

345.37 With heating or cooling means for apparatus part other than workpiece support:
This subclass is indented under subclass 345.1. Apparatus including a means for heating or cooling a part of the apparatus other than a workpiece support to alter or maintain the temperature thereof.

345.38 With multiple gas energizing means associated with one workpiece etching:
This subclass is indented under subclass 345.1. Apparatus including a plurality of separate gas energizing means arranged to simultaneously or sequentially energize a gas to render it effective to conduct etching of a workpiece.

345.39 With means to generate and to direct a reactive ion etchant beam at a workpiece:
This subclass is indented under subclass 345.1. Apparatus including a means to create an ion beam of reactive etchant species and to direct the beam to the workpiece.

345.4 With means to direct electron beam or ion beam to a gas to energize the gas:
This subclass is indented under subclass 345.1. Apparatus including means to create an ion or electron beam and to direct the beam at a gas to energize the gas and render it effective as an etchant.

345.41 With microwave gas energizing means:
This subclass is indented under subclass 345.1. Apparatus including means for energizing a gas by microwave excitation to render it effective as an etchant gas.

345.42 With magnetic field generating means for control of the etchant gas:
This subclass is indented under subclass 345.41. Apparatus including means for creating a magnetic field for control of the etchant gas.

345.43 Having glow discharge electrode gas energizing means:
This subclass is indented under subclass 345.1. Apparatus including means to energize a gas through electron glow discharge from at least one electrode to render it effective as an etchant gas.

345.44 Electrically coupled to a power supply or matching circuit:
This subclass is indented under subclass 345.43. Apparatus including a power supply or matching circuit electrically coupled with the glow discharge electrode to provide sufficient power to the electrode for energizing the gas.

345.45 Including more than two electrodes (e.g. triode reactors):
This subclass is indented under subclass 345.43. Apparatus including three or more glow discharge electrodes.

345.46 With magnetic field generating means for control of the etchant gas:
This subclass is indented under subclass 345.43. Apparatus including means for creating a magnetic field for control of the etchant gas.

345.47 Parallel plate electrodes:
This subclass is indented under subclass 345.43. Apparatus including a pair of parallel planar glow discharge electrodes.

345.48 With radio frequency (rf) antenna or inductive coil gas energizing means:
This subclass is indented under subclass 345.1. Apparatus including means for energizing a gas through radiated or inductively coupled radio frequency electromagnetic energy to render it effective as an etchant gas.

345.49 With magnetic field generating means for control of the etchant gas:
This subclass is indented under subclass 345.48. Apparatus including means for creating a magnetic field for control of the etchant gas.

345.5 With means for photochemical energization of a gas using ultraviolet, visible or x-ray radiation:
This subclass is indented under subclass 345.1. Apparatus including means to energize a gas through absorption of ultraviolet, visible, or x-ray radiation to render it effective as an etchant gas.

345.51 With workpiece support:
This subclass is indented under subclass 345.1. Apparatus including a heated, cooled, movable, or structurally defined means which holds the workpiece to be etched.

345.52 With means to heat the workpiece support:
This subclass is indented under subclass 345.51. Apparatus wherein the holding means includes a heating device to heat the holding means.

345.53 With means to cool the workpiece support:
This subclass is indented under subclass 345.51. Apparatus wherein the holding means includes a cooling device to cool the holding device.

345.54 With means to move the workpiece inside the etching chamber:
This subclass is indented under subclass 345.51. Apparatus wherein the holding means produces movement of the workpiece.

345.55 With means to cause rotary movement of the workpiece:
This subclass is indented under subclass 345.54. Apparatus wherein the holding means is capable of producing circular motion of the workpiece.

346 This subclass is indented under the class definition. Apparatus particularly adapted to making sheets of settable inorganic material covered on both faces with a preformed sheet material.

(1) Note. In this subclass may be found, for example, apparatus in which a plastic settable material is flowed onto a backing sheet, and then a cover sheet is applied to the face opposite face from the backing sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:
39+, for plaster board making processes.

SEE OR SEARCH CLASS:
425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclass 123 for composite article making by means supporting plural preforms in spaced relation in a molding cavity.

347 This subclass is indented under subclass 346. Apparatus having means to alter the configuration of the face of the formed sheet.

(1) Note. In this subclass may be found apparatus for forming and perforating the face of the sheet, indenting the face of the sheet, etc.

348 This subclass is indented under subclass 346. Apparatus having means modifying the formed sheet at or adjacent the edge only.

(1) Note. In this subclass may be found, for example devices beveling, indenting, or chamfering the edge only of the sheet, folding the facing sheet at the edge, slitting at the edge, etc.

349 This subclass is indented under the class definition. Apparatus having (a) means bringing adhesive parts into contacting relationship one with the other, (b) means bringing parts into contacting relationship and subsequently causing them to be adhered, or (c) means causing previously associated parts to be adhered one to the other.

(1) Note. Attention is directed to the class definition of this class, sections "A. Bonding And/Or Assembly Therefor", and "B. Laminating Combined With Other Operations", which set forth in detail the lines with other classes and supplementary fields of search.

350 This subclass is indented under subclass 349. Apparatus having (1) means to sense a condition or change in condition and in response thereto cause a control operation, or (2) means directly responsive to presence or absence of the work and causing a control operation.

(1) Note. With respect to (1) above, the condition sensed must be something other than the normal cyclical operation of the machine. Further, a change in the normal cycle of operation caused by the intervention of the machine attendant would not be included. With respect to (2) above, the normal cyclical operation of the machine may be maintained or

controlled by the presence of work at the work station.

(2) Note. The condition sensed may be a condition or property of the work (either before or after laminating), of the laminating or working apparatus, or any change in the environment of the apparatus, which sensing means stops, starts or otherwise modifies the operation of the apparatus.

(3) Note. Mere sensing means alone to determine a condition or change thereof without in turn causing a control operation is not sufficient for placement in this or the indented subclasses. A control function of the apparatus must be effected when the sensed condition or change of condition occurs for complete automatic control.

SEE OR SEARCH THIS CLASS, SUBCLASS:

365, for apparatus including safety interlocks.

367, for devices including an electrical control means.

378, for means performing a sensing function and in response thereto causing a signal or indicating means to be actuated rather than a control operation for the apparatus.

351 This subclass is indented under subclass 350. Apparatus in which at least two sensing means are associated in a system whereby the control operation is determined by more than a single one of the sensing means.

352 This subclass is indented under subclass 350. Apparatus in which the control action causes the termination or disabling of action of the complete apparatus including the drive means therefor.

353 This subclass is indented under subclass 350. Apparatus in which the device controlled is means severing the workpiece.

(1) Note. The material may be cut before, during or after the laminating or assembly step.

SEE OR SEARCH THIS CLASS, SUBCLASS:

510, for laminating means having cutting means not automatically controlled and see the notes thereto for the locus of cutting means, per se.

354 This subclass is indented under subclass 353. Apparatus having structure in addition to the cutting means for performing the function of transporting the cut segment to that part of the apparatus where joining occurs, or for performing the function of assembling the cut portion with the workpiece to which it is to be adhesively bonded.

355 This subclass is indented under subclass 353. Apparatus in which the severing means is controlled by means detecting or sensing the movement through the machine of the discrete element to which the severed element is to be applied.

(1) Note. To be included here the discrete element must move through and beyond the machine and not merely reciprocate relative to a portion of the machine.

356 This subclass is indented under subclass 350. Apparatus in which the element controlled comprising means directing or bringing a flowable or gaseous material into contact with the work.

(1) Note. The fluent material may be, for example, adhesive material to provide a bond or coating material for functions other than that of adhering the workpieces.

357 This subclass is indented under subclass 356. Apparatus in which the means applying the flowable or gaseous material is controlled by means detecting or sensing the presence or absence of the work to which the material is to be applied.

358 This subclass is indented under subclass 350. Apparatus wherein the means controlled causes the surfaces of the workpieces to be forced into intimate contact one with the other for adhesive bonding.

359 This subclass is indented under subclass 350. Apparatus in which (1) the temperature of a portion of the apparatus is controlled and/or (2) the movement of said portion of the apparatus to apply or vary the degree of heat exchange is controlled.

(1) Note. Mere thermostatic control to only maintain constant temperature of a tool, material or work is conventional and excluded from this subclass. Search for such subject matter should be made in various classes providing for heating or heat controls.

360 This subclass is indented under subclass 350. Apparatus wherein the sensing means (1) detects a variation in the heaviness or size of a workpiece or (2) measures the heaviness or size of a workpiece and controls an operation characterized by a particular reading of the measurement.

(1) Note. Mere sensing or detecting the article because of weight or presence is not sufficient to be classified here. The instant devices perform a measurement as part of the sensing step as distinguished from mere presence or absence response.

361 This subclass is indented under subclass 350. Apparatus in which the means controlled starts, stops, changes or otherwise effects the direction of travel and/or rate of motion (1) of continuously traveling work or work of unspecified length, or (2) of traveling flexible web carrying adhesively secured thereto a workpiece to be transferred to a separate phase.

SEE OR SEARCH THIS CLASS, SUBCLASS:
540, for transfer apparatus which does not include an automatic control feature.

362 This subclass is indented under subclass 350. Apparatus in which the means controlled directs separate articles to be adhesively secured to a separate element into association with said element or to a position in the apparatus where the securing step occurs.

363 This subclass is indented under subclass 362. Apparatus in which the feeding means is controlled by means detecting or sensing the state of the workpiece to which the article is fed.

(1) Note. The "state" of the workpiece includes, for example, presence, absence, alignment, or any other characteristic capable of being detected. The patents of this subclass may have sensing means to determine the cyclical presence of the workpiece in normal operation as disclosed in these patents.

364 This subclass is indented under subclass 363. Apparatus in which the article fed has a planar surface and is of great length and width relative to its thickness.

(1) Note. Most of the patents in this subclass are paper or paper-like material but the subclass is not so limited.

365 This subclass is indented under subclass 349. Apparatus having means to (1) prevent operation of the apparatus when in unguarded, abnormal or unsafe condition such as would injure the operator, or (2) interconnect machine parts to prevent action when the parts are not in proper operational condition, operation thereof would injure the machine.

SEE OR SEARCH CLASS:
53, Package Making, subclass 77 for devices there provided for having interrelated or safety controls.
100, Presses, subclasses 341 through 352 for a press not provided for elsewhere having a safety control system subclass and 353 for a press not provided for elsewhere having an interrelated control system.

366 This subclass is indented under subclass 349. Apparatus having a mechanism which limits the period of operation of the device on the workpiece.

(1) Note. Mere cyclical operation of a machine is excluded from this subclass in that the majority of the devices of the subclass will serially laminate successive sandwiches in a definite pattern of

operation. The subject matter of this subclass must have the element of control in it, such as, for example, a variable timer that may be present for a particular treatment interval.

SEE OR SEARCH CLASS:
368, Horology: Time Measuring Systems or Devices, for timers, per se.

367 This subclass is indented under subclass 349. Apparatus having an electrical means for causing and/or controlling laminating that consists of more than mere single power or motive means with or without a manual switch therefor.

SEE OR SEARCH THIS CLASS, SUBCLASS:
350+, for automatically controlled devices which may include electrical control means.

368 This subclass is indented under subclass 367. Apparatus in which the control operation results in the termination of the machine operation or starts the machine on its operating cycle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
352, for apparatus having an automatic control for stopping the machine operation.

378 This subclass is indented under subclass 349. Apparatus having mechanism for: (1) signalling a condition or property of the work or apparatus, or (2) performing a test on the physical or chemical state, dimension or properties of the material being worked.

SEE OR SEARCH CLASS:
65, Glass Manufacturing, subclass 158 for glassworking or treating apparatus combined with signal, indicator, or inspection means.
100, Presses, subclass 99 for presses having indicating, measuring or testing means and see the notes thereto for the locus of other art having these features.

379 This subclass is indented under subclass 349. Apparatus having (1) mechanism modified or constructed to permit or perform an observation on a normally nonvisible machine or workpart or (2) mechanism lighting a portion of the work or machine.

379.6 With means applying wave energy or electrical energy directly to work:
This subclass is indented under subclass 349. Apparatus including mechanism to treat the work with electrical or electrostatic wave energy.

(1) Note. The energy must directly contact and treat the work in the form of waves, rather than be converted to some other form of energy and then be directed against the work. Thus, resistance heating of work by including it as part of an electric circuit and passing current therethrough is here, but using a separate resistance heater and applying the generated heat to the work by conduction is excluded.

(2) Note. Mere heating of work by conduction or convection is not wave energy for the purpose of this subclass.

(3) Note. The energy may be applied to the work, for example, in the form of infrared rays, X-rays, a magnetic field, etc.

(4) Note. Except for those patents included in subclasses 379.7 and 379.8, the apparatus included herein is structurally of general utility for heating, pressing, molding, etc., but is intended for use in laminating. For a complete search, the classes and subclasses which provide for the proximate function of the claimed structure need to be consulted.

SEE OR SEARCH THIS CLASS, SUBCLASS:
272+, for processes involving the direct application of electrical or wave energy.
580.1+, for apparatus having means to treat the work with sonic or ultrasonic waves or vibrations.

SEE OR SEARCH CLASS:

29, Metal Working, subclass 900 for a method of or apparatus for assembly of self sustaining objects by the use of electrostatic attraction; see the notes to these subclasses for other loci dealing with electrostatic forces for a method or apparatus for assembly of self-sustaining objects by the use of electrostatic attraction, and see the notes thereto for other loci dealing with electrostatic forces.

83, Cutting, subclass 170 for a cutting machine having means to heat the cutting tool or the work.

100, Presses, subclasses 92+ for a heated press.

118, Coating Apparatus, subclasses 620+ for coating apparatus having means to apply electrical or wave energy, and see the notes thereto for the locus of other patents relating to this art.

219, Electric Heating, subclasses 600+ for induction heating devices; and subclasses 200+ for radiant heating devices.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 174+ for molding or deforming machines having means for applying electrical or wave energy to the work.

379.7 To an electrically conductive lamina or component incorporated into the work:

This subclass is indented under subclass 379.6. Subject matter wherein the utility of the apparatus depends upon including an electrically conductive member in the product, e.g., a metallic foil, a wire, metallic or graphite particles, etc.

379.8 With means to assemble laminae or position them relative to each other:

This subclass is indented under subclass 379.6. Subject matter including a mechanism for handling separately the laminae to be bonded, for holding them in an offset relation during bonding, for overlapping edges of a single lamina, or holding the edges in overlap, etc.

(1) Note. A mechanism for merely holding work in place does not qualify a patent for classification in this or its indented subclasses. The criterion to be applied is as follows: If the claimed mechanism calls for no more elements than can be used to heat, compress, mold, etc., a single article or layer of material, it is not classified in this or indented subclasses, even though only a portion of the article or material is thus treated.

379.9 With plural diverse heating means:

This subclass is indented under subclass 379.8. Subject matter having mechanisms for delivering heat to the work by two or more different modes.

(1) Note. Examples of diverse modes are (a) a radiant heating means and a dielectric heating means, and (b) a conductive heating means and an inductive heating means, etc.

380.1 With tube-forming means:

This subclass is indented under subclass 379.8. Subject matter including a mechanism for forming a tube from planar, usually one-layer, material.

(1) Note. Usually radiant heat is applied to the tube seam for bonding.

(2) Note. A mechanism for performing a mere bonding operation upon material already in the form of a tube, e.g., seaming to make bags from a tube, is not included herein.

380.2 With electrode or coil member contacting work:

This subclass is indented under subclass 379.8. Subject matter including a carrier of electric current, or its insulation, in direct physical contact with the work to be bonded.

(1) Note. The coil is a closed, electrically conductive member suitable for generating a varying magnetic flux or for reception of such magnetic flux to produce an induced electric current.

380.3 Electrodes on opposing sides of smallest dimension of work:
This subclass is indented under subclass 380.2. Subject matter wherein two or more current carriers face each other across the thickness dimension of the work.

(1) Note. Inductive coil members are not included herein.

380.4 With means moving one electrode toward the other electrode:
This subclass is indented under subclass 380.3. Subject matter including mechanism for shifting an electrode between positions closer to and farther away from another electrode.

(1) Note. Resiliently mounted (e.g., by springs to compensate for varying thicknesses of moving work) electrodes, without an additional mechanism for moving the electrode into and out of contact with the work, are not included herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:
350, for a similar apparatus which includes means for controlling the shift automatically due to a process parameter.

380.5 With means to change the configuration of a lamina, e.g., folding, deforming, etc.:
This subclass is indented under subclass 380.4. Subject matter including a mechanism for reshaping a lamina to be bonded.

(1) Note. The shape change must be one affecting the planar characteristics of the lamina or a surface of a lamina; merely compressing the workpiece does not indicate classification in this subclass.

(2) Note. An electrode may comprise the reshaping means, or the means may be another, nonelectrically involved, element.

380.6 With electrode having a mechanical function; e.g., pressing, etc.:
This subclass is indented under subclass 379.6. Subject matter including an electric current-carrying mechanism which is configured to perform a mechanical function upon the workpiece, that is, to change the structure of, or transport the workpiece.

380.7 Cutting, tearing, or breaking function:
This subclass is indented under subclass 380.6. Subject matter including an electrode which cuts, tears, or breaks the workpiece.

SEE OR SEARCH CLASS:
83, Cutting, subclasses 170+ for a cutting machine having means for modifying or controlling the temperature of the tool or workpiece.
225, Severing by Tearing or Breaking, subclass 93.5 for a breaking or tearing apparatus, including means to apply a thermal shock to the work.
451, Abrading, subclass 33 and 53 for a process of abrading which includes temperature modification or temperature control of the work or abradant.

380.8 Shaping or deforming function; e.g., patterned electrode, etc.:
This subclass is indented under subclass 380.6. Subject matter including an electrode which shapes or deforms the workpiece, giving the workpiece a configuration determined by the configuration of the electrode.

SEE OR SEARCH CLASS:
264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 405+ for a shaping or deforming process which includes the direct application of electrical or wave energy to the work, especially subclasses 449+ for direct contact of electrode or electrical wire with precursor or workpiece.
425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 174+ for cognate apparatus.

380.9 With radiant heater not touching work:
This subclass is indented under subclass 379.6. Subject matter including a radiant heater mechanism which is out of physical contact with the work.

(1) Note. Sources of radiant heat include lasers, infrared rays, heat radiated from heated bars or wires, etc.

SEE OR SEARCH CLASS:
219, Electric Heating, subclasses 385+ for a radiant heater combined with a container, enclosure, or support for material to be heated.

381 This subclass is indented under subclass 349. Apparatus having walls completely surrounding the work, which walls form a space within which the work is bonded.

(1) Note. The enclosing means must be separate from laminating pressure surfaces. Mere press platens which envelope the work during the press step are thus excluded and such structures may be found in appropriate subclasses below.

382 This subclass is indented under subclass 381. Apparatus in which the treating chamber is fluid tight and mechanism is provided to change the pressure relative to the ambient pressure.

383 This subclass is indented under subclass 349. Apparatus combined with means adapted to make an article in which a loosely held or non-bonded part is enclosed or surrounded by at least two parts bonded to each other.

SEE OR SEARCH THIS CLASS, SUBCLASS:
79, for processes for encasing movable or loosely confined elements between adhered laminae (e.g., drawstrings).

384 This subclass is indented under subclass 349. Apparatus in which the assembly or bonding operation is combined with means to produce characters or designs on the work by impression of type or dies or by impression from planos:graphic or intaglio surfaces.

(1) Note. To be included in this subclass the printing involved must be of the same general scope as the printing provided for Class 101, Printing.

SEE OR SEARCH THIS CLASS, SUBCLASS:
277, for corresponding methods.

SEE OR SEARCH CLASS:
101, Printing, appropriate subclasses for printing, per se.
106, Composition: Coating or Plastic, subclasses 31.01+ for marking compositions and subclass 31.17 for ink compositions.

385 This subclass is indented under subclass 384. Apparatus in which the bonding mechanism and the printing mechanism are actuated at the same time.

386 This subclass is indented under subclass 385. Apparatus in which the member which does the printing is the same member that applies the laminating pressure.

387 This subclass is indented under subclass 384. Apparatus in which the printing is done on a surface of the work which is subsequently adhered to form a laminated product.

388 This subclass is indented under subclass 384. Apparatus in which the printing operation is performed subsequent to the laminating operation.

389 This subclass is indented under subclass 349. Apparatus which includes means to prepare the apparatus for the bonding or assembly operation or to place it in better condition to perform its function or to remove superfluous and undesirable residue of the assembly or bonding operation from the structure.

SEE OR SEARCH CLASS:
65, Glass Manufacturing, subclass 168 for apparatus cleaning means, and subclasses 171+ for repair, assembly or disassembly means combined with glassworking or treating means.
118, Coating Apparatus, subclass 70 for coating devices having means to clean or recondition the work support surface.

390 This subclass is indented under subclass 349. Apparatus in which the assembly or bonding means is combined with a means to apply a coating to the work which coating does not function as an adhesive to bond the parts together.

SEE OR SEARCH THIS CLASS, SUBCLASS:

278, for methods of coating the nonadherent face of a lamina.

SEE OR SEARCH CLASS:

118, Coating Apparatus, appropriate subclasses for coating apparatus, per se.

391 This subclass is indented under subclass 349. Apparatus in which the means bringing the parts into assembled relationship is (1) secured to and supported by one of the parts or (2) adapted to traverse the surface of one of the parts with the direction of travel being controlled by the part.

SEE OR SEARCH THIS CLASS, SUBCLASS:

523+, for devices which traverse the work and include a cutting mechanism and in which the direction of travel is controlled by the operator.

574+, for devices which traverse the work and in which the direction of travel is controlled by the operator.

392 This subclass is indented under subclass 391. Apparatus which includes means for bonding a flexible covering material about and into embracing engagement with a cylindrical body of indefinite length.

(1) Note. Most of the patents in this subclass include a wrapping means which is supported by the pipe and travels along the pipe during the wrapping operation.

393 This subclass is indented under subclass 349. Apparatus in which the assembly or bonding mechanism is combined with a braiding or weaving means.

(1) Note. To be included in this subclass the braiding or weaving must be of the same type as defined by Classes 87 and 139 respectively.

SEE OR SEARCH CLASS:

87, Textiles: Braiding, Netting, and Lace Making, for braiding, per se.

139, Textiles: Weaving, for weaving, per se.

394.1 Tire body building type:

This subclass is indented under subclass 349. Apparatus uniquely adapted for assembling the various components in manufacturing flexible or resilient articles for use on the periphery or rim of a vehicle wheel to absorb shock.

(1) Note. To be classified in this and indented subclasses the patent must claim a device, or sub-combination of a device, specifically adapted for assembling the elements of a tire body either into the form of an endless article or an article which has a circular or horse shoe shaped cross section. The device does not necessarily need to form a toroidal shaped article but may, for example, form a flat band to be later shaped into the form of a toroid. The recitation in a claim of "a drum" is considered sufficient to classify a patent in this and indented subclasses and thus tire building drums, per se, are classified herein subclasses 414+.

(2) Note. This and indented subclasses do not provide for forming inner tubes. Such devices are classified according to their assembly operation. For example, splicing inner tubes is classified in subclass 503 and devices for cutting a hole in a tube and securing a valve in the hole are in subclass 514. Also, apparatus for forming an article of toroidal shape which is not disclosed as a tire is not classified here but is classified according to the various operations of the device. For example, apparatus for winding and laminating is classified in subclasses 425+ and 443+.

This and indented subclasses do not provide for forming stock material of indefinite length for use in building tires, even though assembly of tire components may be involved, unless the stock is either circular or horse shoe shaped in cross section. Such apparatus is classified according to the operation of the device. For example, uniting indefinite length webs is in subclasses 543+ and severing fabric and reuniting to form bias fabric is in subclass 512.

(3) Note. This and indented subclasses do not provide for forming bead rings, per se. For such apparatus see subclasses 422+.

(4) Note. This and indented subclasses provide for the filling of tires with a liquid material only when claimed in combination with apparatus for forming the tire body. If no chemical reaction or change in physical state is involved and there is a mechanical relationship between the article support and the filling means the patent is classified in Class 141, Fluent Material Handling, With Receiver or Receiver Coacting Means. Devices for filling a tire with a fluent material in which there is no chemical reaction or change in physical state of the liquid and no relationship between the tire support and the filling means are classified in Class 137, Fluid Handling.

SEE OR SEARCH THIS CLASS, SUBCLASS:

75, for processes of balancing a tire during its manufacture.

94+, for methods of repairing or renewing tires.

110.1+, for methods of making tires or tubes.

381+, for apparatus having walls completely surrounding the work, which walls form a space within which the work is bonded and which are separable from laminating pressure surfaces.

584, for devices for removing tread stock, beads and piles from a tire carcass, or for removing adhered tires from rims.

909, cross-reference art collection for apparatus for laminating a new tread, or tire portion to a used tire carcass wherein the new tire component is preformed and not reshaped by the laminating apparatus.

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, subclasses 104+ for apparatus for drying a hollow article, e.g., a tire, etc.

81, Tools, subclasses 15.3+ for repairing tools for tires.

137, Fluid Handling, for filling tires with a liquid. See (4) Note above for line with this and other classes.

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclass 65 for tire deflating means which draw by vacuum from the interior of the tire. See other appropriate subclasses for devices for filling tires with a liquid and see (4) Note above for the line with this and other classes so far as filling is concerned.

157, Wheelwright Machines, subclass 13 for devices for grooving, slitting, or lacerating rubber tires, or tire bodies; and subclasses 14+ for means which hold at least one component of a wheel in a particular position, or orientation either relative to (a) another component of the wheel when the wheel is assembled, or disassembled, or (b) a repairing, or surfacing tool working on the tire component of the wheel.

222, Dispensing, subclass 92 for tube deflating by applying external pressure to collapse the tube.

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 50.1+ for devices for spreading beads, or sidewalls of a tire when not combined with a tire building step.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclass 326 for reshaping toroidal shaped work pieces.

269, Work Holders, appropriate subclasses for devices which during a work treating operation, contacts a workpiece for the purpose of supporting the work, or preventing the movement of the work.

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, appropriate subclasses, for heated reaction vessels, or autoclaves.

451, Abrading, for an abrading process performed on a tire casing or for an apparatus for performing an abrading process on a tire casing.

395 This subclass is indented under subclass 394.1. Apparatus for separating an adhered self-supporting protective cover material from an element prior to uniting the protected surface to itself or to an additional lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
584, for apparatus for delaminating not combined with tire building.

396 This subclass is indented under subclass 394.1. Apparatus which includes the association of more than a single building drum, and/or means for moving a single building drum serially from one assembly or shaping station to another.

(1) Note. In this subclass may be found, for example, manufacturing plants which continuously produce tires by an assembly line type of operation.

(2) Note. For the definition of building drum see subclass 394.1.

397 This subclass is indented under subclass 394.1. Apparatus for building tires directly from strands and/or narrow tapes without first assembling them to form a fabric.

(1) Note. A strand is any workpiece of great length relative to its cross section and of generally equal cross section height and width. For the purpose of this subclass, a narrow tape is any workpiece of great length and with a width greater than its thickness, said width being such that several widths in side-by-side relationship are required to cover the total surface area being formed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
117, for corresponding methods.

398 This subclass is indented under subclass 394.1. Apparatus especially designed to perform a shaping, cutting, uniting or assembling operation on a tire in the area of the bead.

(1) Note. The mere recitation that beads are present in a tire or that a building form is adapted to receive a bead is not sufficient to place a patent in this subclass. Such patents are classified according to their assembly means. The claims must recite some specific means which compensates for the fact that a bead is present or is being incorporated into the tire. For example, a stitching element which merely traverses the area of the bead is placed in subclasses 408+ and not here while a stitching element designed to fold fabric around a bead is placed in this and indented subclasses.

399 This subclass is indented under subclass 398. Apparatus for cutting away excess fabric which extends beyond the bead after shaping the fabric to conform to the bead.

400 This subclass is indented under subclass 398. Apparatus which includes means for supporting fabric in the form of a cylinder with a bead ring positioned over at least one end of the fabric cylinder and additional means for turning the fabric back over the bead ring.

401 This subclass is indented under subclass 400. Apparatus in which an expansible impervious container adapted to be inflated is placed between the end of the fabric cylinder and the fabric support so that on inflation the bag will turn the fabric over the bead.

402 This subclass is indented under subclass 400. Apparatus in which a rotary body turns the cylinder end back over the bead ring.

403 This subclass is indented under subclass 398. Apparatus with means to aid in guiding or aligning the bead ring with respect to the tire body during the assembly operation.

(1) Note. See (1) Note in subclass 398 for the line with regard to the degree of structure necessary to place a patent in this group of subclasses.

(2) Note. This subclass includes means to guide a bead ring into position even though the assembly operation is done by hand.

404 This subclass is indented under subclass 394.1. Apparatus in which the resiliency of the tire is produced either by the resiliency of the material used in construction, or the material used has entrapped gases therein, which gas is at atmospheric pressure or less when the tire is not under load.

(1) Note. For the line between this and other classes with regard to filling tires with liquid see (4) Note of subclass 394.1.

(2) Note. Device for assembling tires which are intended to be filled with gas under pressure (i.e., pneumatic tires) to provide resiliency are classified according to the particular assembly means claimed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
112+, for corresponding methods.

405.1 With fabric or tread stock feeding means: This subclass is indented under subclass 394.1. Apparatus which includes specific means for feeding and/or controlling the feed of fabric or tread material from a supply to the assembly station.

(1) Note. To be included here, the patent must include more than a nominal recitation of a fabric source.

(2) Note. Where the claims do not include a laminating means or an assembly means for laminating, e.g., a tire-building drum, etc., the patent is not properly classified in this class (156). See the notes to the materials-handling classes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
395, for feeding means which include means delaminating a protective lamina from the fabric or tread fed to the assembly means.
397, for means feeding strands or narrow tapes to a tire assembly station.

SEE OR SEARCH CLASS:
112, Sewing, appropriate subclasses for apparatus for assembling and sewing together tire plies when no laminating elements are provided for.
193, Conveyors, Chutes, Skids, Guides, and Ways, appropriate subclasses for means for keeping a gravity-fed material on a given path of travel.
198, Conveyors: Power-Driven, appropriate subclasses for a driven conveyor made up of several elements and generally mounted on a common frame.
212, Traversing Hoists, appropriate subclasses for apparatus for lifting a load and shifting it laterally.
226, Advancing Material of Indeterminate Length, appropriate subclasses for web-feeding devices in general, which do not depend upon the leading or trailing edges of the web for their function.
242, Winding, Tensioning, or Guiding, subclasses 563+ and 564+ for means to control unwinding and drive means to cause unwinding, respectively, in general use.
271, Sheet Feeding or and Delivering, appropriate subclasses for sheet conveying, per se, and in combination with certain other operations.
294, Handing: Hand and Hoist-Line Implements, appropriate subclasses for devices combined with handles, terminal elements, or attachments peculiarly adapted for engaging supporting articles or materials for handling or manipulating purposes.
414, Material or Article Handling, appropriate subclasses for material or article handling apparatus not elsewhere provided for.

406 This subclass is indented under subclass 405.1. Apparatus which includes more than one source of material and means for selecting from which source the material is to be supplied.

(1) Note. The various sources may supply either the same or different types of material.

SEE OR SEARCH CLASS:
242, Winding, Tensioning, or Guiding, subclasses 560+ for selectively useable elongated material supplies available for end splicing.

406.2 For transporting discrete ring-shaped lamina:
This subclass is indented under subclass 405.1. Subject matter including means for feeding a lamina which has been formed into an endless ring.

(1) Note. The ring need not be circular, but may be oval, etc.

406.4 With cutting, heating, laminating, or shaping means upstream of assembling means:
This subclass is indented under subclass 405.1. Subject matter including means for treating the fed material by changing its shape, cutting it or raising its temperature, said treating being accomplished before the material arrives at the assembly station.

SEE OR SEARCH THIS CLASS, SUBCLASS:
906, for a collection of patents drawn to process and apparatus for the manufacture of tire components prior to the assembly of all components on the tire-buildingdrum.

406.6 Stretching means:
This subclass is indented under subclass 406.4. Subject matter in which the shaping means applies tension to the material to elongate it.

(1) Note. A means for merely tensioning a web fed to the assembly means does not determine a patent for this subclass unless there is a positive recitation that the web is stretched.

(2) Note. Where the assembly means itself, e.g., a tire-building drum, etc., is part of the combination of elements which performs the only stretching; the stretching means is not considered "upstream".

SEE OR SEARCH CLASS:
26, Textiles: Cloth Finishing, subclasses 71+ for a devices for stretching cloth, per se.

407 This subclass is indented under subclass 394.1. Apparatus for supporting a tire or tire building drum for rotation in which the rotating means either has a center of rotation which is eccentric to the center of rotation of the tire or drives the tire from its external periphery.

(1) Note. This subclass includes devices in which the tire body is assembled over two or more rotating supports in such a manner that the tire body resembles a belt running over pulleys.

SEE OR SEARCH THIS CLASS, SUBCLASS:
457, for centerless core rotating apparatus in which the article being formed is not a tire.

408 This subclass is indented under subclass 394.1. Apparatus which includes a means for supporting and rotating a tire and a pressing means which wipes or travels along the surface of the tire during rotation.

(1) Note. This subclass includes, for example, stitching or pressing elements which cover substantially the width of the tire and bear against the tire during its rotation.

409 This subclass is indented under subclass 408. Apparatus in which the pressing means traverses the surface of the tire in more than one direction.

(1) Note. This subclass includes, for example, stitching or pressing elements which bear against the surface of the tire and traverse back and forth across the surface always exerting pressure in the same direction even though the tire surface being traversed may not be flat.

410 This subclass is indented under subclass 409. Apparatus in which the pressing means includes means to change the direction in which force is applied to the pressing means.

(1) Note. This subclass includes, for example, stitching or pressing elements which bear against and traverse the surface of a rotating tire and always exert pressure at approximately right angles to the surface being traversed. The stitching or pressing element is designed to change their direction of force as the plane of the surface being pressed changes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

398+, and especially subclass 402, for devices for folding carcass fabric about a bead in which the folding and pressing means may have a changing direction of force.

411 This subclass is indented under subclass 410. Apparatus in which the force applied to the pressing means in the direction of rotational axis of the tire is provided by an operator.

(1) Note. Devices in which a manual force is applied in a direction parallel to the axis of rotation of the tire are classified above and not here unless claimed in combination with a manual force toward the axis of rotation.

412 This subclass is indented under subclass 408. Apparatus in which the pressing takes the shape of the surface being pressed.

(1) Note. The pressing surface may either be made of deformable material or it may be made up of a group of press elements mounted side by side on resilient supports such that each element can shift relative to the others to change the over all configuration of the press surface.

413 This subclass is indented under subclass 408. Apparatus which includes more than one pressing element positioned at spaced points around the periphery of the tire and simultaneously traversing the surface of the tire.

414 This subclass is indented under subclass 394.1. Apparatus limited to a rotatable form or support which is circular in cross section with respect to its axis of rotation with or without support or mounting means therefor and especially adapted to have assembled about its periphery the component elements of a tire.

(1) Note. See (1) Note of subclass 407 for the line with regard to devices which use two or more rotating elements to form a single support.

SEE OR SEARCH CLASS:

157, Wheelwright Machines, subclasses 14+ for means which hold at least one component of a wheel in a particular position or orientation either relative to (a) another component of the wheel when the wheel is assembled or disassembled, or (b) a repairing or surfacing tool working on the tire component of the wheel.

415 This subclass is indented under subclass 414. Apparatus which includes means to vary the width of the peripheral surface of the drum in a direction parallel to its axis of rotation which change of width may also result in a change in the diameter of the drum.

416 This subclass is indented under subclass 414. Apparatus in which the drum is either formed of impervious expansible or deformable material and adapted to have fluid applied to its interior under pressure to increase drum diameter or the drum is made of deformable material and adapted to temporarily change its shape as a result of an external force.

417 This subclass is indented under subclass 414. Apparatus in which the building drum is provided with means to reduce its diameter either by disassembling or shifting the relative position of the elements which make up the periphery of the drum.

418 This subclass is indented under subclass 417. Apparatus in which the means for shifting the relative position of the elements which make up the periphery of the drum include a toothed bar, the teeth of which engage the teeth of a gear.

419 This subclass is indented under subclass 417. Apparatus in which the means for shifting the relative position of the elements which make up the periphery of the drum include an elastic

body which recovers its original shape when released after being distorted.

420 This subclass is indented under subclass 417. Apparatus in which the means for shifting the relative position of the elements which make up the periphery of the drum includes a mechanism in which force is applied to a joint between links.

421 This subclass is indented under subclass 394.1. Apparatus which is especially adapted to travel along the surface of a tire body and apply pressure thereto for the purpose of pressing superimposed layers into an adhering relationship.

(1) Note. This subclass does not include rollers, per se, or rollers with handles merely because they are disclosed as useful as tire stitching tools. To be included here the stitcher must either include some structure which renders the device useful only as a tire stitching tool or it must be claimed in combination with some supporting or manipulating structure other than a handle. This subclass includes, for example, cylindrical stitchers with a surface shaped to conform to the cross section of a tire or a stitcher especially adapted to fit over a bead. 492, Roll or Roller.

SEE OR SEARCH CLASS:

492, Roll or Roller, for a roll, per se, not elsewhere provided for, and see the notes thereunder.

421.2 Tire chamber and means regulating interior casing pressure:

This subclass is indented under subclass 394.1. Apparatus which includes either (a) a chamber incompletely surrounding the tire casing, or work with a means for establishing pressure within the interior of the chamber, or (b) a chamber completely surrounding the work which is, or becomes inseparable from the laminating surfaces with a means for establishing pressure within the interior of the chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

381+, for apparatus having walls completely surrounding the work, which walls form a space within which the work is bonded and which are separable from laminating pressure surfaces.

909, cross-reference art collection, for apparatus laminating a new tread, or tire portion to a used tire carcass wherein the new tire component is preformed and not reshaped by the laminating apparatus

SEE OR SEARCH CLASS:

137, Fluid Handling, appropriate subclasses, for a method, or apparatus for filling tires with a liquid. See (4) Note under subclass 394.1 above for the line with this and other classes.

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclass 65 for tire deflating means which draw by vacuum from the interior of the tire. See other appropriate subclasses for devices for filling tires with a liquid and see (4) Note under subclass 394.1 above for the line with this and other classes so far as filling is concerned.

222, Dispensing, subclass 92 for tube deflating by applying external pressure to collapse the tube.

421.4 With means for folding lamina while on drum:

This subclass is indented under subclass 394.1. Apparatus with a means for folding, or doubling one portion of a wide band, (or tread), or tube of flexible material over upon another portion of the band, etc., while on a drum.

(1) Note. The apparatus of this subclass is used for making a laminated band for a pneumatic tire casing.

(2) Note. This subclass does not provide for the folding of an envelope which is placed around the external surface of a tire casing.

421.6 Tire support with pressing or heating means:

This subclass is indented under subclass 394.1. Apparatus which includes a base means for supporting a tire and means for applying pressure, or heat to the tire.

(1) Note. Apparatus for holding tires in order to bond trim strips, or whitewalls thereto are classified herein.

SEE OR SEARCH CLASS:
100, Presses, appropriate subclasses, for apparatus for subjecting material to compressive force wherein no step, or mechanism peculiar to laminating is recited, or claimed.
269, Work Holders, appropriate subclasses, for devices which, during a work treating operation, contacts a workpiece for the purpose of supporting the work, or preventing the movement of the work.
414, Material or Article Handling, subclasses 426+ for devices comprising a mobile support having means for engaging the outer circumference of a wheel, or wheellike object to support and transport it in upright position and including (a) means to handle, or manipulate it while in upright position, or (b) means to secure the load in upright position during transportation thereof, or (c) means for directing, or loading a wheel onto said support.
422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, appropriate subclasses, for heated reaction vessels, or autoclaves.
425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 44+ for apparatus for molding, or vulcanizing tires in a mold combined with means to apply fluid pressure thereto.

421.8 Ring-shaped lamina stretching means:
This subclass is indented under subclass 394.1. Apparatus which includes a mechanism to stretch a formed tire band, or tread, or another endless belt-type lamina.

SEE OR SEARCH CLASS:
26, Textiles: Cloth Finishing, subclasses 71+ for devices for expanding a running web of cloth when not claimed in combination with a tire assembling apparatus.
38, Textiles: Ironing or Smoothing, subclasses 102+ for devices for smoothing a fabric merely by stretching wherein the fabric is held in a stationary, or immovable position when not claimed in combination with a tire assembling apparatus.

422 This subclass is indented under subclass 349. Apparatus having a rotating mandrel or former adapted for winding tire bead rings, of great diameter relative to their axial length and thickness, from indefinite length material and adhering the layers of material together.

(1) Note. To be included in this subclass the ring-like article produced must be disclosed as useful as tire bead rings.

SEE OR SEARCH THIS CLASS, SUBCLASS:
136, for the corresponding methods.
433+, for uniting strands to form articles other than tire beads.

SEE OR SEARCH CLASS:
242, Winding, Tensioning, or Guiding, for winding, unwinding, tensioning, or guiding related structure of general use.
245, Wire Fabrics and Structure, subclass 1.5 for tire bead rings, and the method of making the same, when formed primarily of wire and not involving a laminating step.

423 This subclass is indented under subclass 349. Apparatus having means inserting a part or portion thereof within enclosing or confining surfaces of a second part and causing the inserted part to be secured thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:
293+, for processes for inserting a lamina in a hole, aperture or recess of a lamina and adhering it to the sidewalls thereof.
392, for laminating devices of the pipe wrapping type.
393, for devices having means encasing a separate nonadhered part between adhered laminae.

424 This subclass is indented under subclass 423. Apparatus in which the device is peculiarly adapted for securing the glass body of a lamp or space discharge device to an end cap or closure.

SEE OR SEARCH CLASS:
445, Electric Lamp or Space Discharge Component or Device Manufacturing, subclasses 60+ for apparatus there provided for for the manufacture of lamps and space discharge devices.

425 This subclass is indented under subclass 349. Apparatus which includes means to progressively bend or wrap an indefinite running length work around a base in such a manner that convolutions are formed with each convolution axially displaced along the base from the preceding convolution.

(1) Note. For the purpose of this subclass the base may be any structure upon which the material is wound regardless of its shape and whether it is later removed or becomes part of the article. The actual length of the material being wound is immaterial so long as it is handled as an indefinite or running length work.

SEE OR SEARCH THIS CLASS, SUBCLASS:
117, for methods of forming a tire by spirally winding a strand or tape.
169+, for methods of winding filaments.
184+, and especially subclass 195, for methods of winding webs or sheets.
397, for apparatus for forming a tire by spirally winding a strand or tape.
443+, for apparatus for winding other than spiral.

SEE OR SEARCH CLASS:
242, Winding, Tensioning, or Guiding, for winding, unwinding, tensioning, or guiding related structure of general use.

426 This subclass is indented under subclass 425. Apparatus which includes means to sever the work such that it can be opened and removed from the base in the form of a sheet or web.

SEE OR SEARCH THIS CLASS, SUBCLASS:
174, for similar methods in which the wound material is strands.
193, for similar methods in which the wound material is a web or sheet.

427 This subclass is indented under subclass 426. Apparatus in which the material which is severed and removed from the base includes strands which are secured to a web or sheet.

428 This subclass is indented under subclass 425. Apparatus in which (1) the base is removed from the wound body and the article which is produced by the wound material is of indefinite or running length or (2) the base is itself of indefinite or running length and becomes part of the article being produced.

SEE OR SEARCH THIS CLASS, SUBCLASS:
53+, for methods of covering electrical conductors which may include a winding operation.

SEE OR SEARCH CLASS:
57, Textiles: Spinning, Twisting, and Twining, subclasses 3+ for apparatus there provided for in which one or more strands are spirally wound about a core to form a strand of indefinite length.

429 This subclass is indented under subclass 428. Apparatus in which the base on which the material wound is caused to rotate about an internal axis to effect the winding operation.

430 This subclass is indented under subclass 428. Apparatus in which more than one indefinite length element is wound around the base.

(1) Note. The elements may be wound sequentially or simultaneously.

431 This subclass is indented under subclass 430. Apparatus in which the base around which the indefinite length material is wound is generally circular in cross section.

432 This subclass is indented under subclass 431. Apparatus in which more than one means is provided for winding the indefinite length material said means being axially spaced along the base.

433 This subclass is indented under subclass 349. Apparatus having means adhering at least one flexible strand, rod, tube or filament of indefinite extension to some other part or for adhering a portion thereof to itself.

(1) Note. A flexible strand, rod, tube or filament is any workpiece of great length relative to its cross-section and of generally equal cross-section height and width. The section size is of no particular significance so far as the subject matter of these subclasses in concerned just so long as the above qualifications are met. Thus in this and the indented subclasses may be found wrapping a web about an endless flexible hose, gathering indefinite fibers to form a rod, applying a web to a running length flexible sponge rubber core. Short finite lengths of filaments, handled individually as units, or alternatively, handled as a mass of fibers are not provided for in these subclasses and rather may be found in other subclasses in this class based on the particular manner of handling. For example, devices for forming self-sustaining bodies of particulate material may be found in subclasses 369+; means delivering short, individually handled rods onto a web may be found in subclasses 552+, etc.

(2) Note. The other part may itself be a flexible strand or filament. Note, for example, subclass 441 in which strands are united to strands only.

SEE OR SEARCH THIS CLASS, SUBCLASS:

166+, for processes for adhering flexible filamentary material while in indefinite or running length

369+, and see (1) Note above.

392, for work secured or guided laminating devices of the pipe wrapping type.

393, for laminating devices combined with braiding or weaving means.

397, for devices building tires from strands or narrow tapes.

422, for strand or filament uniting devices of the ring winding type.

425+, for strand or filament uniting devices in which the strand or filament is spirally wound about a core, mandrel or workpiece. Generally no cross references are made from subclasses 425+ to the instant subclasses so to search for spirally wound strands a search must be made in subclasses 425+.

502, for means splicing flexible indefinite length bodies end-to-end which bodies are not strands but are rather films, tapes or belts.

SEE OR SEARCH CLASS:

242, Winding, Tensioning, or Guiding, for a device for winding elongated material.

434 This subclass is indented under subclass 433. Apparatus in which means place discrete elements one after the other and spaced from each other between and transversely of the axis of at least two parallel strands and adheres them thereto.

(1) Note. In this subclass may be found, for example, devices for making spaced multiple conductor transmission lines.

SEE OR SEARCH THIS CLASS, SUBCLASS:

65+, for processes of assembly and bonding of multiple spaced elements between and transverse of parallel webs, e.g., venetian blind ladders.

552, for laminating devices having means bringing articles into association with an endless web.

435 This subclass is indented under subclass 433. Apparatus uniquely adapted to the manufacture of a textile material having short filaments extending generally perpendicular to the plane of the material.

(1) Note. In these devices the filaments must be united or bonded while still of running or indefinite length. They may

then be sheared to produce the pile fabric. The typical method involves steps of continuously looping parallel strands, bonding the loops to a backing and then shearing the loop tops to form the pile.

SEE OR SEARCH THIS CLASS, SUBCLASS:
72, for processes for setting or embedding tufts or discrete pile elements onto a backing.

SEE OR SEARCH CLASS:
118, Coating Apparatus, subclasses 308+ for means projecting solid particulate material against work to be coated therewith (for example, flocking devices).

436 This subclass is indented under subclass 433. Apparatus in which the running length flexible strand, rod, tube or filament is bonded to a running length flexible web.

SEE OR SEARCH THIS CLASS, SUBCLASS:
425+, and other appropriate subclasses, for means spirally winding strands.
543, for apparatus for bonding flexible running length web to articles other than those provided for here.

437 This subclass is indented under subclass 436. Apparatus combined with means to continually form the flexible web from a mass of material by a plastic working or molding operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
500+, for other laminating apparatus combined with molding or plastic shaping means.

438 This subclass is indented under subclass 436. Apparatus combined with means to cause the web to be doubled on itself, the line of fold paralleling the longitudinal axis of the web.

SEE OR SEARCH THIS CLASS, SUBCLASS:
461+, for other laminating means combined with means folding a web longitudinally.

439 This subclass is indented under subclass 436. Apparatus in which at least a portion of the flexible strandlike material is disposed crosswise of the length of web to which it is secured.

(1) Note. Diagonal or bias disposition is also considered crosswise for the purpose of this subclass.

440 This subclass is indented under subclass 439. Apparatus in which the means feeding the flexible strand-like material is mounted for back and forth movement transversely of the axis of the web.

441 This subclass is indented under subclass 433. Apparatus having means bringing strand-like workpieces only into adhered relationship one to the other.

(1) Note. The product resulting from the assembly and adhering operation of this subclass may be subsequently adhered to some other part, but to be classified here, at least one of the operational steps must be the adherance of strand-like materials only.

SEE OR SEARCH THIS CLASS, SUBCLASS:
180+, for process for associating filaments only to form an article.

441.5 This subclass is indented under subclass 349.1. Apparatus uniquely adapted to adhere the flap of a flat flexible receptacle to the body thereof.

442 This subclass is indented under subclass 441.5. Apparatus combined with means for applying and adhering a stamp or label to the receptacle.

442.1 This subclass is indented under subclass 441.5. Apparatus combined with means for applying a distorting force to the envelope so as to permanently deflect at least a portion of it out of its normal plane.

(1) Note. A machine which manipulates envelope flaps from an opened or extended position to a closed position (i.e., overlying the receptacle body) is considered to be bending within the scope of this subclass, regardless of

whether the envelope has been previously creased.

SEE OR SEARCH THIS CLASS, SUBCLASS:

443+, for a patent to bending and folding means combined with bonding means, of general utility.

442.2 This subclass is indented under subclass 441.5. Apparatus combined with means for feeding the receptacle to or through the work station.

442.3 This subclass is indented under subclass 442.2. Apparatus in which the feeding means moves alternately backward and forward in a rectilinear path for transporting the receptacle to the work station.

SEE OR SEARCH THIS CLASS, SUBCLASS:

572, for a patent to apparatus for separating articles from a bulk source by means of a translating picker.

442.4 This subclass is indented under subclass 441.5. Apparatus in which a device is particularly adapted to move as a unit over the surface of the receptacle being sealed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

574+, for a patent to apparatus of the work traversing type having general utility.

SEE OR SEARCH CLASS:

118, Coating Apparatus, subclasses 264+ for a moistener having a porous or absorbent applicator to which such work as an envelope (or stamp) is brought (e.g., sponge cup).

443 This subclass is indented under subclass 349. Apparatus having means applying a distorting force to a workpiece to permanently deflect at least a portion of it out of its normal plane.

(1) Note. The temporary distortion of a workpiece due to handling is excluded from this subclass. Thus, winding or unwinding a web for temporary storage or feed to the device, bending a web around feed rollers on the way to or from the work station, festooning a web for storage are examples of work bending excluded from this subclass in that the distortion is temporary.

(2) Note. The devices of this and the indented subclass do not shape by plastically deforming the work such as by an embossing molding or casting operation. In the instant subclass the work does not change materially in section thickness during the working operation other than by doubling over, etc. This latter feature is characteristic of a bending or folding operation as distinguished from a shaping operation involving plastic flow. For shaping operations involving plastic flow search must be made in appropriate subclasses below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

196+, for laminating processes involving a bending step.

346+, for plaster board making apparatus having folding means for a facing sheet.

392, for laminating devices of the pipe wrapping type.

393, for laminating devices having braiding or weaving means.

394.1+, and other appropriate subclasses for tire building devices which may include means to bend or wind a lamina.

422, for laminating devices of ring winding type.

425+, for laminating devices having spiral winding means for the work.

433, for indefinite or running length strand or filament uniting devices which may have filament bending means.

442.1, for a patent to envelope sealing means combined with means to fold the envelope flap.

500, and see (2) Note above.

581+, for laminating presses, per se, having a relieved or configured pressing face.

585+, for sheet or web deforming or reshaping means, per se.

444 This subclass is indented under subclass 443. Apparatus in which means direct a pneumatic blast directly against the work to cause it to bend.

445 This subclass is indented under subclass 443. Apparatus in which means are provided to cause the workpiece being shaped to assume the shape and embrace a spherical core.

(1) Note. In this subclass may be found, for example, device for applying cover material to playing balls.

SEE OR SEARCH THIS CLASS, SUBCLASS:
186, for laminating processes including a step of winding a web or sheet about a spherical core.

SEE OR SEARCH CLASS:
242, Winding, Tensioning, or Guiding, subclasses 435+ and 436 for a device for winding elongated material on a spherical core.

446 This subclass is indented under subclass 443. Apparatus in which an arbor or a workpiece is supported or mounted for rotation about an internal axis and means are provided to bend a flexible sheet about the arbor or workpiece during rotation thereof.

(1) Note. In this subclass the rotating of the mandrel or article generally causes the progressive bending of the flexible material about at least a portion of the peripheral surface thereof.

(2) Note. Most of the patents in subclasses 394+ apply a lamina to a rotating mandrel or an article supported thereon in building a tire. The majority of these devices (subclasses 394+) are specialized to tire building and therefore relatively few cross-references have been placed between the groups of subclasses. However in some instances a complete search requires investigation of both groups of subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:
394.1+, and see (2) Note above.

447 This subclass is indented under subclass 446. Apparatus having means causing the flexible sheet to be applied to a particular selected portion of the periphery.

(1) Note. The devices of this subclass all apply the sheet to a pre-designated area of the rotating article as distinguished from devices in which the sheet is placed in a random manner and by chance to the periphery of the article.

448 This subclass is indented under subclass 446. Apparatus in which the workpiece in addition to rotating, has an additional motion which bodily displaces the workpiece.

449 This subclass is indented under subclass 448. Apparatus in which the motion of translation of the workpiece is caused by contact of the periphery thereof with a supporting surface, which surface is traversed during rotation.

450 This subclass is indented under subclass 449. Apparatus in which an indefinite length flexible web material is applied to the rotating mandrel or article and wound thereon.

451 This subclass is indented under subclass 449. Apparatus in which the rolling mandrel or article adheres to and rolls across the surface of the end sheet of a stack of sheets and in rolling causes the sheet to be removed from the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
564, for other devices having a magazine stack directly contacting separate work.

452 This subclass is indented under subclass 451. Apparatus in which the rolling motion is caused by downward passage of the workpiece under the influence of gravity.

453 This subclass is indented under subclass 451. Apparatus in which the rolling motion of the workpiece is caused by an endless belt contacting the periphery thereof.

454 This subclass is indented under subclass 449. Apparatus in which the rolling motion of the workpiece is caused by downward passage of the workpiece under the influence of gravity.

455 This subclass is indented under subclass 449. Apparatus in which the rolling motion of the workpiece is caused by an endless belt contacting the perihery thereof.

456 This subclass is indented under subclass 448. Apparatus in which the workpiece moves about an axis external thereof, the path of motion being curved.

457 This subclass is indented under subclass 446. Apparatus in which the rotating mandrel or article is supported at or adjacent its periphery.

(1) Note. In the case of a hollow article, such as a large diameter pipe, it may be supported at its inner periphery rather than the outer peripheral surface yet still fall within the scope of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

407, for centerless core tire building apparatus and see (2) Note of subclass 446.

458 This subclass is indented under subclass 446. Apparatus in which work handling means presents rotating mandrels or articles one after the other to a position where a lamina is secured thereto.

459 This subclass is indented under subclass 443. Apparatus in which the distorted work is of elongated or attenuated material of indeterminate or indiscriminate linear dimension.

SEE OR SEARCH THIS CLASS, SUBCLASS:

543+, for devices laminating at least on indefinite or running length flexible web and see the notes thereto for the locus of other art.

460 This subclass is indented under subclass 459. Apparatus in which means apply the flexible web to an endless ring or belt.

(1) Note. In this subclass may be found, for example, devices for covering tire bead rings or endless drive belts by wrapping or winding a fabric cover thereabout.

461 This subclass is indented under subclass 459. Apparatus having means bending the web, the line of the bend extending in the direction of the length of the web.

462 This subclass is indented under subclass 461. Apparatus in which means cause the web to be distorted in section transverse of the axis of the web into a plurality of reversing curves.

463 This subclass is indented under subclass 461. Apparatus in which separate spaced forming means act on the same portion of the web one after the other.

464 This subclass is indented under subclass 461. Apparatus having means bringing separate finite length articles into association with the web one after the other.

SEE OR SEARCH THIS CLASS, SUBCLASS:

552, for apparatus having means bringing articles into association with a traveling flexible web.

465 This subclass is indented under subclass 461. Apparatus in which separate areas of a single web are brought into physical contact one with the other for bonding of the areas to each other.

466 This subclass is indented under subclass 465. Apparatus peculiarly adapted to make an indefinite length hollow body by joining the edges only of flexible web.

SEE OR SEARCH THIS CLASS, SUBCLASS:

203, for processes for longitudinally bending and edge joining a one piece blank to form a tube.

467 This subclass is indented under subclass 461. Apparatus for joining longitudinally aligned webs one to the other and in which the webs are either (1) of different widths or (2) displaced laterally with respect to each other so that their centers do not coincide.

468 This subclass is indented under subclass 459. Apparatus in which means cause the web to conform to and be bonded to a configured lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
475, for other devices bending a lamina to the configuration of the base to which it is bonded.

469 This subclass is indented under subclass 459. Apparatus in which shape determining means are removed from the configured web in the plane of the web and transversely of the web longitudinal axis.

470 This subclass is indented under subclass 459. Apparatus in which means direct a flexible web into association for bonding with the web that has been distorted.

(1) Note. In this subclass may be found, for example, devices for corrugating a web and then bonding a facing sheet thereto.

471 This subclass is indented under subclass 479. Apparatus having means maintaining the distorted configuration of the shaped web and means directing the separate web into association with the distorted web while still on the distortion maintaining means.

(1) Note. In this subclass may be found devices inserted into the corrugations of a web to prevent them from collapsing under laminating pressure.

472 This subclass is indented under subclass 471. Apparatus in which the shape retaining means is cylindrical in section and has longitudinally extending recesses in the outer periphery.

SEE OR SEARCH CLASS:
428, Stock Material or Miscellaneous Articles, subclass 604 for metallic stock having corrugations.

473 This subclass is indented under subclass 472. Apparatus having a discrete means maintaining the shaped web on the retaining means.

474 This subclass is indented under subclass 459. Apparatus having means causing the web to be progressively and repeatedly folded back on itself to produce a zig-zag folded product.

(1) Note. The pleated product is generally distinguished in that the faces of the folded product are in contact with one another as distinguished from a corrugated product in which the walls of the corrugations are spaced.

475 This subclass is indented under subclass 443. Apparatus having means distorting a workpiece against and into the configuration of a nonplanar base lamina to which it is adhered.

(1) Note. Shaping assembled and/or bonded laminae together is not provided for in this subclass. In the subject matter of the instant group the base lamina remains unchanged in shape.

(2) Note. Mere resilient platen surfaces to conform to surface irregularities of the lamina without changing its gross configuration are not provided for here. The devices must change bodily the configuration of the lamina.

SEE OR SEARCH THIS CLASS, SUBCLASS:
212, for process of bending or reshaping a lamina to assume the shape of a configured lamina while in contact therewith.
383, for devices having means encasing a separate nonadhered part between adhered laminae.
392, for work secured or guided laminating devices of the pipe wrapping type.
394.1, for tire body building devices which may, is some instances, have means to cause a lamina to assume the configuration of a base to which it is secured.
446+, for devices in which a flexible sheet is secured to and assumes the configuration of a rotating mandrel or article.
459+, for laminating devices having means shaping an indefinite or running length flexible web and in which the web may be caused to assume the

configuration of the lamina to which it is secured.

581+, for presses or platen surfaces, per se, having a relieved or configured pressing face there provided for and see the notes thereto for the locus of other press structures, per se.

476 This subclass is indented under subclass 475. Apparatus in which more than one workpiece is presented to work stations and each workpiece is distorted or shaped by discrete work means.

(1) Note. The work means usually act on the separate workpieces simultaneously but the subclasses are not necessarily so limited in that separate work may be alternately acted on by the separate work means.

477.1 Plural, distinct, sequential bending or folding means:
This subclass is indented under subclass 475. Apparatus in which separate working elements sequentially bend or fold the same workpiece.

(1) Note. The separate means may act on the same area of a workpiece to progressively shape it, or they may act on different areas of a single workpiece.

(2) Note. A means which merely forces workpiece into assembled relation or holds them is such relation is not considered a bending or folding means. Likewise, a means which merely smooths a workpiece portion which has already been bent or folded out of its original plane is not considered a bending or folding means. Thus, this subclass requires at least two folding and/or bending means, acting one after the other, other than whatever means are employed to push, press, hold, or smooth workpiece or workpiece portion. Alternatively, a pushing, pressing, holding, or smoothing means must also perform a bending or folding function if it is to considered one of the plural sequential means.

478 This subclass is indented under subclass 477. Apparatus in which the bending means make separate bends and the axis of bend or line of fold of at least two of the bends meet at a point.

(1) Note. In this and the indented subclasses may be found, for example, devices for casing books covers in which a flexible sheet is bent around at least two contiguous edges of a board, also devices for bending the edges of U-shaped pocketbook frames, etc.

479 This subclass is indented under subclass 478. Apparatus in which the bending means causes portions of a sheet to be bent around the edge portion of a sheet-like lamina.

480 This subclass is indented under subclass 479. Apparatus have in addition means compressing the folded sheet at the junction of the intersecting axis.

(1) Note. The devices are usually for the purpose of flattening the gathered folded material.

481 This subclass is indented under subclass 477.1. Apparatus in which the bending means act in sequence to effect a curvilinear contour to the part being joined.

482 This subclass is indented under subclass 477.1. Apparatus in which the direction of action of the sequential means is in separate planes which intersect.

(1) Note. For example, a label is applied to the side of a box and one set of means bends it over the ends thereof with part of the label extending beyond the box. Another set of means acting transversely thereto then bends the end back over the opposite side of the box.

SEE OR SEARCH THIS CLASS, SUBCLASS:

459, for means bending an endless web to the configuration of a base which bending may result in intersecting bend axis.

483 This subclass is indented under subclass 475. Apparatus in which the work travels in a single direction through an opening or passageway, which passageway is of smaller linear dimension than a sheet to be applied to the work and traveling therethrough with the work.

(1) Note. In these patents the work does not reciprocate relative to the passageway, rather it moves through and beyond it. Also, the work moves rather than the bending means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

486+, for apparatus in which the moving member moves past the work to perfect the bending.

484 This subclass is indented under subclass 483. Apparatus in which the sheet to be adhered and bent is carried on and disposed across the passageway, the work moving into contact therewith.

SEE OR SEARCH CLASS:

100, Presses, subclasses 17+ for binder applying devices in which the binder to be applied is supported across a passageway for the material.

485 This subclass is indented under subclass 484. Apparatus having means discrete from the passageway to perfect the bend.

486 This subclass is indented under subclass 475. Apparatus in which the distorting member wipes along or traverses the surface being shaped.

487 This subclass is indented under subclass 486. Apparatus in which the work contacting surface of the deforming means is comprised of a brush-like element.

488 This subclass is indented under subclass 486. Apparatus in which the distorting means comprises a flexible mass of material, bodily reshaped to the configuration of the work by pressure there against.

489 This subclass is indented under subclass 486. Apparatus in which the distorting means comprises at least two movable members urged toward one another to apply pressure to work positioned therebetween.

490 This subclass is indented under subclass 489. Apparatus in which a member is provided other than the work to cause separation of the biased members against the biasing force.

491 This subclass is indented under subclass 490. Apparatus in which a cam element between the members causes separation thereof.

492 This subclass is indented under subclass 475. Apparatus in which a rigid member is pivoted and is swung about the pivot to cause deformation of the lamina.

(1) Note. The swinging folding member must have motion about a fixed pivot to be classified in this subclass. Mere deformable pads one part of which has a motion relative to another part when pressed into contact with a base are thus excluded and provided for in subclass 493 in that the pad has no fixed pivot.

493 This subclass is indented under subclass 475. Apparatus in which the distorting means comprises a flexible mass of material bodily reshaped to the configuration of the work by pressure thereagainst.

SEE OR SEARCH THIS CLASS, SUBCLASS:

488, for bodily deformable pads which wipe along the surface of the deformed sheet.

494 This subclass is indented under subclass 349. Apparatus combined with means subjecting the work to a stress causing or tending to cause extension of the work.

(1) Note. Mere means for pulling a workpiece through a laminating device against the normal resistance of the device are not considered tensioning devices unless some specific means are present to place a drag on the workpiece and such devices may be found in appro-

priate subclasses below for handling the particular work.

SEE OR SEARCH THIS CLASS, SUBCLASS:

196+, for processes for bending workpieces including a step of stretching the workpiece to reshape it and especially subclasses 212+ for stretch forming processes.

229, for process there provided for involving a stretching step.

405.1+, for tensioning means in combination with means feeding fabric to a tire building machine.

586, for apparatus there provided for having stretching or tensioning means.

SEE OR SEARCH CLASS:

242, Winding, Tensioning, or Guiding, subclasses 410+ and 147+ for a tension device used for regulating longitudinal stress in a running length of material.

495 This subclass is indented under subclass 494. Apparatus in which power operated means cause feed of an indefinite length flexible web to or from a laminating device and a drag is placed on the web motion to tension it.

496 This subclass is indented under subclass 495. Apparatus in which the tensile stress is applied in a direction transverse of the direction of motion of the work.

497 This subclass is indented under subclass 349. Apparatus having means directing work treating material in a gaseous or vaporous state into direct association with the work.

(1) Note. Devices for merely holding the workpiece in ambient air are excluded from this subclass. For such subject matter search the appropriate work manipulating subclass below.

(2) Note. The devices of this subclass must directly contact the workpiece with the gas or vapor, rather than for example, applying pressure through a flexible diaphragm.

SEE OR SEARCH CLASS:

118, Coating Apparatus, subclass 47 for coating devices having means to contact the work with a flame and subclasses 715+ for coating devices having means contacting the base with a gaseous or vaporized coating material and see especially the search notes to subclasses 47 and 715+ for the locus of other patents relating to this subject matter.

498 This subclass is indented under subclass 349. Apparatus having means for reducing the temperature of the work.

(1) Note. The devices of this subclass are usually for the purpose of setting a heat fused joint. However, the subclass is not so limited, including any device for cooling the work or heat exchange means preventing heating of the work by abstracting heat therefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

89.11+, for laminating methods involving a refrigerating or freezing step.

SEE OR SEARCH CLASS:

62, Refrigeration, appropriate subclasses, for cooling devices, per se.

499 This subclass is indented under subclass 349. Apparatus having heating means positioned spaced from the press means whereby the work must be moved to get from the heating area to the pressing area.

(1) Note. Heating is a feature common to a great number of laminating press platens and thus this subclass is restricted to work heating means where the heating means are not incorporated in press platens but rather are a separate means not a part of the press. Heated press platens modified for laminating purposes may be found in subclass 583 and see the notes thereto for the locus of other heated presses.

500 This subclass is indented under subclass 349. Apparatus having means shaping at least one of the laminae by plastic flow of the material of the lamina against a shaping surface.

(1) Note. In this subclass may be found, for example, devices for calendering a web on a roll and directly transferring the web onto a backing.

SEE OR SEARCH CLASS:
65, Glass Manufacturing, subclass 156 for glassworking apparatus combined with article molding means.
425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 110+ for surface bonding of preforms by molding means casting a plastic composition between preforms encased within the molding means. The combination of a distinct Class 156 apparatus and a Class 425 apparatus is classified in Class 156. See the line note between these classes under the Class 425 definition.

501 This subclass is indented under subclass 500. Apparatus in which the shaping means is for producing an indefinite length web which web is stripped from the shaping means and maintains its integrity.

502 This subclass is indented under subclass 349. Apparatus uniquely adapted for joining (a) the butt ends of bodies of indefinite extension, or (b) the butt ends of a flexible body to which the ends have been brought into juxtaposition whereby an endless band of article is formed.

(1) Note. With respect to both (a) and (b) above, the periphery only of the workpieces are handled to bring the parts into assembled relationship and thus the length can be continuous or of any desired amount.

(2) Note. With respect to (b) above the device is usually for joining the ends of a workpiece to form an endless belt. These devices do not have the means bending the workpiece into the loop to bring the ends together, such subject matter being found in subclasses 443+ above with other patents relating to bending means. Insofar as the joining or work holding features therefor, they may be no claimed structural differences between (a) and (b).

(3) Note. Means to merely hold plural pieces (while glue is disclosed and/or claimed as setting) for the purpose of assembly is not considered appropriate for this and indented subclasses. However, the inclusion of claimed means to move or guide plural pieces together for the purpose of assembly will be placed in this or indented subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:
137+, for methods of making endless drive belts which may include a step of butt joining the ends of a flexible length.
157+, for methods of splicing indefinite length laminae end to end.
443+, and see (2) Note above.

SEE OR SEARCH CLASS:
269, Work Holders, appropriate subclasses. Class 269 is the residual locus of patents for a device for clamping, supporting and/or holding an article (or articles) in position to be operated on or treated. See notes thereunder for other related loci.

503 This subclass is indented under subclass 502. Apparatus adapted to join flexible hollow bodies and maintain the hollow nature of the joint.

(1) Note. The majority of the patents in this subclass relate to the splicing of pneumatic tire inner tubes.

SEE OR SEARCH THIS CLASS, SUBCLASS:
122, for tube making methods including a step of joining the tube ends to form the torus.
507, for devices for splicing in which the web ends are moved longitudinally into association one with the other.

504 This subclass is indented under subclass 502. Apparatus adapted to joining the end of a web to another web which is continuously moving

without interrupting the motion of the moving web.

(1) Note. This subclass includes (1) devices which join the webs while the areas being joined are moving in the direction of the traveling web or (2) devices which hold the joining areas stationary during the joining operation while continuing the motion of the web by feeding from an accumulating means.

SEE OR SEARCH CLASS:
242, Winding, Tensioning, or Guiding, subclasses 551+ for web uniting devices in which the webs are carried on reels. The patents are classified in Class 242, where means are recited for bodily displacing the web carrying reel even though adhesion may be claimed. Mere rotation of the reel for web feed, even though reciting speed control, tension control or other perfecting features for the web feed are not sufficient for Class 242 where the reel rotates at a fixed position and laminating is recited.

505 This subclass is indented under subclass 502. Apparatus in which means apply a separate lamina to area of the joint only and adheres it thereto.

506 This subclass is indented under subclass 505. Apparatus in which means are provided to cut off a portion of a joining web prior to the application of the cut off portion to the joining area.

SEE OR SEARCH THIS CLASS, SUBCLASS:
517+, for laminating devices combined with means to cut a workpiece before lamination.

507 This subclass is indented under subclass 502. Apparatus having means moving the two ends to be joined into juxtaposition, the motion being in the direction of the major axis of the stock to be joined.

SEE OR SEARCH THIS CLASS, SUBCLASS:
503, for devices of the tube splicing type which move the tube ends longitudinally into contact.

508 This subclass is indented under subclass 507. Apparatus having (a) solid means to mechanically remove foreign material from the joining surfaces or (b) means to apply adhesive to the surfaces to be joined.

SEE OR SEARCH THIS CLASS, SUBCLASS:
535, for other laminating means combined with means scarifying or cleaning the joining surface only.

509 This subclass is indented under subclass 502. Apparatus having (a) solid means to mechanically remove foreign material from the joining surfaces or (b) means to apply adhesive to the surfaces to be joined.

SEE OR SEARCH THIS CLASS, SUBCLASS:
535, for other laminating means combined with means shaping scarifying or cleaning the joining surface only.
578, for other laminating devices having coating material applying means and see especially the notes thereto.

510 This subclass is indented under subclass 349. Apparatus combined with means to penetrate a workpiece for the purpose of severing or making an opening therein.

(1) Note. The severing operation may take place before, during or after the laminating step and may be caused by means separate from the laminating means or the same means.

(2) Note. The severing may be, for example, to shape an article from stock, to trim off excess, to punch out workpiece from a stock strip, etc.

(3) Note. The severing is usually by means of a solid member. Cutting by means of a gaseous stream is provided for in subclass 497 above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

250+, for laminating methods combined with a step of severing.

353+, for laminating devices having an automatic control of a cutter.

375, for means forming indefinite length self-sustaining webs of particulate material having means cutting or trimming the product.

497, and see (3) Note above.

506, for splicing devices having severing or punching means.

SEE OR SEARCH CLASS:

83, Cutting, appropriate subclasses as the basic class for cutting devices, and see especially the notes to the class definition thereof for the locus of other patents relating to cutting devices.

428, Stock Material or Miscellaneous Articles, subclass 596 for metallic stock which is apertured.

511 This subclass is indented under subclass 510. Apparatus in which at least two separate severing devices each act on a discrete workpiece.

(1) Note. The workpieces need be discrete only during one of the cutting operations; thus, cutting a workpiece prior to uniting and then separate cutting of the united sandwich is included.

512 This subclass is indented under subclass 510. Apparatus in which the device assembles the cut lamina with another lamina derived from the same workpiece.

(1) Note. In this subclass may be found, for example, devices which slit plural strips from a single web and then join them to form a multilayer web.

SEE OR SEARCH THIS CLASS, SUBCLASS:

260, and 264+, for methods of joining laminae cut from a single sheet.

513 This subclass is indented under subclass 510. Apparatus in which the severing means punches or cuts an opening in the workpiece before lamination.

SEE OR SEARCH THIS CLASS, SUBCLASS:

252+, for laminating including a step of perforating one of the laminae.

514 This subclass is indented under subclass 513. Apparatus in which means bonds a discrete lamina across the aperture in the part.

SEE OR SEARCH THIS CLASS, SUBCLASS:

108, for processes of laminating involving the step of mounting a transparent lamina over a window opening.

293, for methods of laminating including a step of inserting a lamina in a hole, aperture or recess of a lamina.

423, for apparatus including means assembling a part within a hole or aperture.

515 This subclass is indented under subclass 510. Apparatus in which the solid severing member causes bonding along the line of severance at the instant of parting of the lamina.

(1) Note. In this subclass may be found, for example, die cutting devices for stamping out patterned pieces from a stacked tacky rubber sheet where the die causes the cut stack edges to adhere.

SEE OR SEARCH THIS CLASS, SUBCLASS:

251, for laminating methods including a step of simultaneously severing and laminating.

516 This subclass is indented under subclass 510. Apparatus in which separate means are provided for positively feeding each of at least two workpieces, which feeding means bring the workpieces into assembled relationship with each other.

517 This subclass is indented under subclass 516. Apparatus in which the severing step occurs before the parts to be bonded are brought into assembled relationship.

SEE OR SEARCH THIS CLASS, SUBCLASS:

256+, for methods of laminating combined with a step of severing the work prior to assembly.

518 This subclass is indented under subclass 517. Apparatus in which the penetrating element of the severing means which causes parting of the material or a pressing member secured to and moving therewith causes bonding of the laminae.

SEE OR SEARCH THIS CLASS, SUBCLASS:

261+, for laminating processes including a punching step and with laminating pressure being applied by the punch.

515, for devices in which the cutting element simultaneously laminates the work.

530, for other laminating devices in which the cutter is secured to the laminating element.

519 This subclass is indented under subclass 517. Apparatus in which the feeding means moves the cut piece into assembled relationship with an indefinite or running length workpiece.

SEE OR SEARCH THIS CLASS, SUBCLASS:

552, for laminating devices having means bringing articles into association with an endless web.

520 This subclass is indented under subclass 519. Apparatus in which the severing element transfers or conveys the cut piece to the article.

SEE OR SEARCH THIS CLASS, SUBCLASS:

261+, for methods of laminating including the step of punching out a part and applying pressure by means of the punch.

521 This subclass is indented under subclass 517. Apparatus in which means move cut parts one after the other into assembled relationship with separate articles each of which is moved one after the other past the assembly point.

522 This subclass is indented under subclass 516. Apparatus in which a portion of an indefinite length web is severed from the web after it is brought into contact with a discrete article.

SEE OR SEARCH THIS CLASS, SUBCLASS:

517+, for devices in which an endless web is cut and the cut piece is then assembled with another workpiece.

523 This subclass is indented under subclass 510. Apparatus in which the laminating device is uniquely adapted to travel along and be supported by the workpiece to which the lamina handled is being secured.

SEE OR SEARCH THIS CLASS, SUBCLASS:

574, for other laminating devices of the work traversing type and see the notes thereto for the locus of other work traversing devices.

524 This subclass is indented under subclass 523. Apparatus having means which direct a liquid against at least one of the laminae.

SEE OR SEARCH THIS CLASS, SUBCLASS:

575, for other work traversing laminating devices having liquid applying means.

525 This subclass is indented under subclass 524. Apparatus having cutting means which separate the workpiece both longitudinally and transversely of its major axis.

526 This subclass is indented under subclass 524. Apparatus in which the material applied by the work traversing device is severed from the source after contact with the work.

527 This subclass is indented under subclass 523. Apparatus in which the severing means is immobile during the severing operation.

528 This subclass is indented under subclass 510. Apparatus uniquely adapted to sever a rectangular sheet-like workpiece from a sheet greater in extension in both dimensions in a single stroke of the cutter.

(1) Note. The devices of this subclass are generally for the purpose of severing or separating an adhesive stamp from a sheet of stamps and include severing means and means indexing the sheet to the next position for severing the next stamp.

529 This subclass is indented under subclass 510. Apparatus having means directing a fluid material against at least one of the laminae.

SEE OR SEARCH THIS CLASS, SUBCLASS:
524, for work traversing devices having means projecting fluid against the work.

530 This subclass is indented under subclass 510. Apparatus in which the severing means is either operatively connected to the laminating press element or is directly attached thereto whereby the two are concurrently actuated.

SEE OR SEARCH THIS CLASS, SUBCLASS:
518, for laminating devices having means feeding plural parts to be joined and in which the severing means or a member secured thereto also laminates.

531 This subclass is indented under subclass 530. Apparatus having means directing a liquid material into contact with a least one lamina.

(1) Note. In this subclass may be found devices which sever a label and moisten the label.

SEE OR SEARCH THIS CLASS, SUBCLASS:
524, for work traversing devices with a cutter and liquid applying means.
529, for laminating devices having a cutter and means projecting a stream or spray of fluid against the work.

532 This subclass is indented under subclass 531. Apparatus in which the laminating press element and the liquid applying means are operatively interconnected whereby the action of one results in the operation of the other.

533 This subclass is indented under subclass 532. Apparatus in which the liquid material is applied to an indefinite length web before a portion thereof is severed for laminating purposes.

534 This subclass is indented under subclass 533. Apparatus in which the liquid material is applied to the web by means of a rotary cylinder.

535 This subclass is indented under subclass 349. Apparatus having means limited in their action to the bonding area of the lamina, and physically modifying the bonding surface by (1) changing the shape or roughing of the joining surface to facilitate the bond, (2) removing foreign matter from the surface to aid the bonding action.

SEE OR SEARCH THIS CLASS, SUBCLASS:
497, for laminating devices having gas, vapor of flame contact means for the work.
509, for splicing devices having means scraping the joining surfaces to facilitate the bond.
510+, for laminating devices combined with severing means for a workpiece which means may incidentally shape the joining surface as well.

SEE OR SEARCH CLASS:
118, Coating Apparatus, subclasses 72+ for coating devices having means to prepare the work surface for coating.
228, Metal Fusion Bonding, subclasses 141.1+ for a process of welding metal including a step of preshaping the work pieces at the joining surface only.
427, Coating Processes, subclasses 299+, for coating processes including pretreatment of the base.

536 This subclass is indented under subclass 349. Apparatus having means associated therewith for performing some function in addition to the basic operation of bonding parts together and not provided for in the preceding subclasses or in which, by relative rearrangement of its parts or by the addition of or omission of a part, the

apparatus is changed so as to become: (a) basic subject matter of this class (156) of a different character or having a different mode of operation or, (b) basic subject matter of another class; thus, for example, a laminating device which, by disabling or removing a part, becomes a mere dispenser, etc., is subject matter for this subclass.

(1) Note. Bonding means includes means assembling parts into relationship for bonding, applying bonding pressure, heating or cooling to perfect the bond and application of adhesive bonding material.

(2) Note. The class definition in Section IIB sets forth the locus of various combinations of laminating and other devices.

537 This subclass is indented under subclass 349. Apparatus having solid means interposed between separate laminae or separate areas of a single lamina which laminae or separate areas which would adhere in the absence of the solid means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

289, for method of laminating involving the use of a parting or release material to prevent adhesion between parts.

323, for method in which a subsequently removed flexible element is interposed between the laminae and a pressure surface.

580+, for platen or press, per se, which may have a facing of an adhesive repellent material.

SEE OR SEARCH CLASS:

101, Printing, subclasses 416+ for antismut devices (e.g., slip sheets) used in the printing art.

538 This subclass is indented under subclass 349. Apparatus having either (a) means moving parts to be bonded into intimate association one with the other (b) means feeding at least one part or lamina to the assembly point (c) means in addition to or separate from the press surfaces holding laminae in assembled relationship.

(1) Note. With respect to (a) above only one of the parts to be bonded need be moved. The other part may be held stationary on an anvil surface, for example.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclasses 146+ for glassworking apparatus with means to feed diverse material thereto; see the "Search Notes" thereunder.

539 This subclass is indented under subclass 538. Apparatus in which (a) at least two elements to be bonded to each other are fed or handled or (b) separate portions of a unitary piece to be bonded together are fed or handled in their final associated relationship.

(1) Note. With respect to (b) above the separate portions are generally in their final positional association in that bringing separate portions together into such relationship would probably require bending means for subclasses 443+.

(2) Note. See subclasses 580+ for press structures, per se, with no work handling other than by the press surfaces and see the notes, especially (5) Note, to that subclass for the lines with Class 100 including the line with respect to presses with work handling features.

SEE OR SEARCH THIS CLASS, SUBCLASS:

443+, and see (1) Note above.

507+, for film splicing devices including means moving the film ends into juxtaposition.

540 This subclass is indented under subclass 539. Apparatus in which a lamina to be secured to a base is carried on and bonded to a flexible tape or sheet and is stripped from the carrier during the securing step.

(1) Note. The devices in this and the indented subclasses are commonly referred to as "transfer devices".

SEE OR SEARCH THIS CLASS, SUBCLASS:

230+, for methods of surface bonding involving direct contact transfer of adhered lamina from a carrier to the base lamina and especially subclass 238 where the carrier is a running or continuous flexible web.

584, for delaminating, per se.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 90.01+ for devices for burnishing a metal leaf coating on a base.

101, Printing, appropriate subclasses for transfer printing devices wherein a printing die is used to cause direct transfer of a portion of a lamina carried on a flexible sheet. In Class 101 may be found, for example gold leaf printing devices in which the leaf is directly transferred from a carrier to the article utilizing a die stamp acting on the back of the flexible sheet.

400, Typewriting Machines, subclass 118.1 for a typewriter that applies gold leaf, and subclass 696 for a typewriter wherein an error is corrected by an adhesive ribbon.

541 This subclass is indented under subclass 540. Apparatus in which a plurality of separate laminae not in contact with one another are carried on the carrier web or sheet.

542 This subclass is indented under subclass 541. Apparatus in which laminae are transferred successively from the flexible carrier to (a) separate articles presented one after the other to the laminating position to receive the laminae or (b) different areas of a single article which are successively presented to the laminating position.

543 This subclass is indented under subclass 539. Apparatus having means feeding elongated or attenuated material of indeterminate or indiscriminate linear dimension in a direction generally along said dimension.

SEE OR SEARCH THIS CLASS, SUBCLASS:

425+, for devices for spirally winding and uniting running or indefinite length spiral workpieces.

433+, for apparatus for uniting indefinite or running length flexible strands or filaments.

SEE OR SEARCH CLASS:

226, Advancing Material of Indeterminate Length, for devices, per se, for feeding a running or indefinite length work and see especially the notes thereto for other devices having similar means.

544 This subclass is indented under subclass 543. Apparatus having means causing indefinite or running work of sheet or web-like form to be bonded together by butting the longitudinally extending edges.

SEE OR SEARCH THIS CLASS, SUBCLASS:

304.1, for methods for butt edge joining of laminae.

466, for apparatus bending a web longitudinally and joining the edges thereof.

502+, for means splicing flexible indefinite length or endless bodies end-to-end.

545 This subclass is indented under subclass 544. Apparatus having means applying a further lamina of sheet-like material covering the butt edge joint.

SEE OR SEARCH THIS CLASS, SUBCLASS:

505+, for apparatus splicing indefinite length or endless bodies end-to-end and applying an adhesive tape to the splice.

546 This subclass is indented under subclass 544. Apparatus having means for applying fluent material to the contacting edge faces to cause adhesion thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

547, and see the notes thereto for the locus of other art relating to the application

of adhesive to the joining surfaces of laminae.

547 This subclass is indented under subclass 543. Apparatus having means for transferring material in a flowing state onto at least one of the contacting surfaces of the laminae to be secured together, which material causes adherence of the laminae.

(1) Note. The flowing material of this and the indented subclasses may be either the adhesive, per se, or it may be a fluid activator for adhesive previously applied. Mere heated air to render adhesive tacky is excluded from these subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

325, for processes of laminating utilizing a particular adhesive and see the notes thereto of the locus of other laminating processes including a step of applying an adhesive.

578, and see the notes thereto for the locus of patents relating to laminating devices combined with adhesive or adhesive activator applying means.

548 This subclass is indented under subclass 547. Apparatus in which the fluent material is applied at separate points or in a discontinuous or varied pattern.

SEE OR SEARCH THIS CLASS, SUBCLASS:

291, for method of bonding laminae at spaced points only by nonuniform adhesive application.

553, and 581+, for devices having a discontinuous or patterned press surface.

549 This subclass is indented under subclass 547. Apparatus in which the fluent material is applied to at least one of two or more indefinite or running length workpieces.

550 This subclass is indented under subclass 549. Apparatus in which the fluent material applying means is located at the point of convergence of two webs approaching one another for bonding.

551 This subclass is indented under subclass 549. Apparatus in which either (1) a single applying means is contacted by separate workpieces before association, or (2) separate applying means each apply material to separate workpieces.

552 This subclass is indented under subclass 543. Apparatus having means moving discrete, separately handled, finite workpieces into assembled relationship with an indefinite length web for bonding thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:

302+, for methods for bonding plural discrete laminae to a running length web.

383, for apparatus having means encasing a separate nonadhered part between adhered laminae.

390, for laminating apparatus combined with means for applying particulate coating material to the work.

464, for devices longitudinally bending a web and feeding discrete articles thereto for joining to the web.

519+, for laminating devices having cutting means and means delivering the cut part to an indefinite or running length web.

520, for devices in which a cutter itself delivers a cut part to an indefinite or running length web.

522, for cutting a web after association with a discrete article.

540+, for devices in which discrete laminae are transferred to a base from a web-like carrier.

556+, for devices bringing discrete articles into association one with the other.

553 This subclass is indented under subclass 543. Apparatus in which the laminae are caused to adhere by being subjected to approaching pressure surfaces and in which the pressure surfaces are relieved, configured in outline, or intermittently contact the same workpiece whereby the workpieces are joined at spaced points or in an irregular manner.

(1) Note. In this subclass may be found, for example, devices that transversely seam traveling webs at spaced intervals. A

longitudinal seam, even though narrower than the joined webs, is not provided for here where a continuous, even width seam is formed. Such subject matter is classified on other bases such as, for example, web width (subclass 554) or continuous press (555).

SEE OR SEARCH THIS CLASS, SUBCLASS:

290, for methods of bonding continuously contacting laminae at spaced points.
554, and 555, and see (1) Note above.
581+, for laminating presses, per se, having a relieved or configured pressing face.

554 This subclass is indented under subclass 543. Apparatus having means feeding plural webs into association, one with the other, and in which the webs are traveling in the same direction and are of different dimensions in breadth transversely of the direction of travel.

555 This subclass is indented under subclass 543. Apparatus in which the work moves in uninterrupted manner through the press and is joined without loss of continuity of the bond.

SEE OR SEARCH THIS CLASS, SUBCLASS:

324, for methods of joining webs of indefinite length.
580, for press structures, per se, which have no work feeding or handling means other than the press elements and see the notes thereto for the locus of other patents relating to presses.

556 This subclass is indented under subclass 539. Apparatus having means causing separate workpieces to move into association one with the other for adhesive joining thereof.

(1) Note. The devices of this subclass must have handling means for each of the parts joined even though only one of the parts need be moved for association.

SEE OR SEARCH THIS CLASS, SUBCLASS:

362+, for automatic control of the feed of articles to the assembly station.
369+, for devices forming self-sustaining webs of particulate material where the particles are not individually handled as discrete units but are rather deposited in bulk or from a bulk source.
423+, for means assembling a part within a hole or aperture of a second part.
475+, for devices joining discrete parts wherein one part is bent into the configuration of the part to which it is secured during the joining operation.
516+, for laminating devices combined with severing means and having means feeding plural parts to be joined.
552, for laminating devices having means bringing discrete articles into association with a traveling flexible web.

557 This subclass is indented under subclass 556. Apparatus having (1) plural applying means each applying separate articles simultaneously to separate workpieces, or (2) separate concurrently operating lines of conveyance for workpieces, each line having means applying articles to the workpieces.

(1) Note. With respect to (1) above, the workpiece must not merely progress serially to the plural applying means for the successive application of multiple articles. In other words separate articles must be produced from separate lamina applying means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

559, for apparatus applying at least two articles to a single base.
561, for devices applying plural ranks or files of articles to a base.

558 This subclass is indented under subclass 556. Apparatus in which all of the articles assembled to form a multilayered body are fed from a single bulk supply.

(1) Note. In this subclass may be found, for example, devices for forming gear blanks by serially stacking similar blanks picked off a pile, or devices for producing indefinite length articles by continually adding laminae from a source to one edge of the previously joined laminae.

559 This subclass is indented under subclass 556. Apparatus in which means are provided for associating more than two articles for adhesive bonding.

(1) Note. This and the indented subclasses provide for means associating the plural articles regardless of the order of association. The articles may all be applied face to face to form a stack of coextensive articles or a plurality of articles may be applied to a single base article.

560 This subclass is indented under subclass 559. Apparatus having means applying more than a single lamina to an article the applied laminae being disposed adjacent each other and generally disposed in the same plane.

(1) Note. In this and the indented subclasses may be found, for example, devices for applying multiple labels to a bottle, applying sample swatches to a card (subclass 561).

SEE OR SEARCH THIS CLASS, SUBCLASS:

476, for laminating devices having plural discrete bending means each acting on a separate article. The majority of the patents in this subclass (476) relate to multiple labeling or applying plural laminae to a single base and thus a complete search must include this subclass.

561 This subclass is indented under subclass 560. Apparatus in which at least two rows, each row comprising separate laminae, are applied to the single base article.

562 This subclass is indented under subclass 560. Apparatus in which the plural laminae are applied to a planar surface base of great length and width relative to its thickness.

563 This subclass is indented under subclass 559. Apparatus in which the articles are consecutively assembled face to face to form a multilayered article.

SEE OR SEARCH THIS CLASS, SUBCLASS:

299, for process for assembling planar laminae face to face.

564 This subclass is indented under subclass 556. Apparatus in which one of the sources of discrete article parts comprises a container holding a pile of articles arranged in face-to-face contact and in which the end article of the pile is in facial contact with a separate workpiece.

SEE OR SEARCH THIS CLASS, SUBCLASS:

573, for apparatus having a magazine stack directly contacting the work but having no work feeding or handling means for the base to which the magazine held articles are to be applied.

565 This subclass is indented under subclass 564. Apparatus in which the container holding the pile of stacked articles is mounted for motion to and from the separate workpiece.

SEE OR SEARCH THIS CLASS, SUBCLASS:

573, for other magazine stack devices which may or may not be mounted for motion.

566 This subclass is indented under subclass 556. Apparatus in which a single conveyor structure has means simultaneously and serially moving plural articles to the assembly point for assembly each with a separate workpiece.

(1) Note. In this and the indented subclasses may be found, for example, endless belts conveying a plurality of bottles one after the other to a labeling station. The conveyor need not have separate or holding means for each article but may merely provide discrete support areas for plural articles as in the case of a belt-type work conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

569+, for pickers for separating articles from a bulk source. The devices there are either single pickers, or if multiple, do

not present the work to the assembly point.

567 This subclass is indented under subclass 566. Apparatus in which the conveying means comprises a carrier having a plurality of work-holding means positioned about an axis of revolution and means causing the carrier to rotate about the axis.

(1) Note. The carrier may move continuously or may index intermittently into and out of the laminating station.

SEE OR SEARCH THIS CLASS, SUBCLASS:

571, for rotary pickers. The pickers separate an article from a bulk source and present the article to the laminating station, but do not handle the article after association.

568 This subclass is indented under subclass 567. Apparatus in which the rotary turret or drum conveyor is particularly adapted to handle non-rigid sheet-like articles.

569 This subclass is indented under subclass 556. Apparatus in which at least one of the article handling means includes a device which isolates and removes or causes to be removed an article to be laminated from a batch supply for transfer to the assembly point.

SEE OR SEARCH CLASS:

221, Article Dispensing, appropriate subclasses, for article dispensers, per se, and see the notes to the class definition for the locus of other article dispensers.

271, Sheet Feeding or Delivering, appropriate subclasses for devices for separating sheets from a supply when not combined with a laminating step.

570 This subclass is indented under subclass 569. Apparatus in which the bulk supply of articles comprises a pile of sheets arranged face to face.

SEE OR SEARCH THIS CLASS, SUBCLASS:

564, and 573, for devices in which a magazine stack directly contacts the work to which at least one of the stacked articles is to be applied.

571 This subclass is indented under subclass 570. Apparatus in which the means separating the articles from the bulk source has motion about an axis of revolution during the separation of the article from the source and bodily transports the article during separation.

(1) Note. A picker must grasp or be secured in some way to the article it is transporting, such as by clamping, adhesion, impaling, etc.. Thus a device merely pushing an element off a pile would not be a picker.

SEE OR SEARCH THIS CLASS, SUBCLASS:

567+, for rotary pickers which also serially convey plural articles to an assembly station.

572 This subclass is indented under subclass 570. Apparatus in which the picker moves bodily in a rectilinear path while transporting and separating the article from the sheet source.

SEE OR SEARCH THIS CLASS, SUBCLASS:

442.3, for a patent to reciprocating feed means to feed an envelope to or through a work station.

573 This subclass is indented under subclass 538. Apparatus in which the work feeding or handling means comprises a container adapted to be brought into association with a base to which a sheet-like article is to be laminated, the container holding a pile of the sheet-like articles arranged face to face and the end article of the pile in facial contact with the work.

(1) Note. The devices of this subclass do not claim the means handling the base to which the stack derived article is applied. Therefore the claims recite either a hand held or manipulated applier or the subcombination of magazine disclosed for use with a base work manipulator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

564+, for magazine stack work carriers combined with means to manipulate the base to which the work is to be joined.

570+, for laminating apparatus having means to separate a sheet from a stack and present it to the laminating station.

SEE OR SEARCH CLASS:

221, Article Dispensing, appropriate subclasses for article dispensing devices, per se, and see the notes to the class definition for the locus of other article dispensers.

574 This subclass is indented under subclass 538. Apparatus in which a laminating device is particularly adapted (a) to move as a unit over and be supported by the surface of the work to which a lamina is being applied or (b) to apply a lamina to an installed device or portion of a building surface.

(1) Note. The devices of this and the indented subclasses feed or handle only a single lamina in that the base to which the lamina is secured is of such character that it is not handled, being fixed, installed, or otherwise supported. By "feeding or handling" with reference to this subclass, is meant some element other than the means directly applying the laminating pressure. A roller support for a web being applied to a wall as in wall papering would be considered sufficient work handling. Thus the devices of this and the indented subclasses must have at least two elements, (1) a pressing or applying means and (2) a material handling, feeding or guiding means. Under this restriction then, mere applying brushes or rollers with handles would not be provided for in these subclasses in that applying only with no work handling is claimed. Subclass 579 below provides for mere handled applying elements.

(2) Note. The devices of this subclass are controlled manually by the operator and the direction and speed are controlled by him. For devices of the work traversing type in which the law of the machine and its relationship to the work controls the direction search must be made in subclasses 391+.

SEE OR SEARCH THIS CLASS, SUBCLASS:

71, for processes of applying a lamina to a building or installed structure.

391+, and see (2) Note above.

442.4, for a patent to work traversing envelope sealing means.

523+, for work traversing devices combined with cutting means.

579, and see (1) Note above.

SEE OR SEARCH CLASS:

248, Supports, appropriate subclasses for supports for holding wall paper against a surface for application thereto by hand and not claiming any means for causing actual adherence of the paper to the surface.

575 This subclass is indented under subclass 574. Apparatus having means applying a liquid material to the work.

(1) Note. The liquid material is usually a bonding agent for causing adhesion of the laminae and may be applied to either the surface traversed or the work handled.

SEE OR SEARCH THIS CLASS, SUBCLASS:

356, for laminating apparatus having means automatically controlling the application of fluent material to the work.

390, for laminating apparatus combined with means for coating the work with materials other than adhesives.

524+, for work traversing laminating devices combined with cutting means for the work.

SEE OR SEARCH CLASS:

118, Coating Apparatus, subclass 108 for work supported or guided coating devices.

576 This subclass is indented under subclass 574. Apparatus having means to grasp the end of a flexible sheet for positioning of the sheet for laminating.

577 This subclass is indented under subclass 574. Apparatus having means mounted on the traversing device for supporting a bulk supply of flexible web material, from which supply the material is fed in use.

(1) Note. The supply is usually in the form of a roll or reel of the material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

523+, for work traversing devices having a cutter and an implement carried supply. The majority of the patents in these enumerated subclasses disclose this feature and search must be made therein to complete the search for this subject matter.

SEE OR SEARCH CLASS:

242, Winding, Tensioning, or Guiding, and especially subclass 533.8 and 557 for a mobile carrier for a winding or unwinding device.

578 This subclass is indented under subclass 538. Apparatus having means contacting a lamina with a fluent material which material causes the laminae to be bonded together.

(1) Note. The fluent material may be either an adhesive or adhesive activator. Mere treatment with hot air to activate the adhesive, however, is excluded from this subclass; see subclass 499 for laminating devices combined with means separate from the laminating press for heating the workpiece, and subclass 497 for laminating devices having gas, vapor or flame contact means for the work.

SEE OR SEARCH THIS CLASS, SUBCLASS:

325, for methods of laminating involving the use of a particular adhesive and see especially the notes thereto for the locus of other patents relating to the method of application of fluent materials to the materials.

356+, for devices having means automatically controlling the application of fluent material to the work.

390, for apparatus having coating means which coating means is for some purpose other than or in addition to the means applying adhesive for laminating.

442, for combined envelop sealing and stamp applying devices.

497, for gas, vapor or flame contact means for the work, which means may render tacky the work or a coating thereon.

509, for means splicing indefinite length or endless bodies end-to-end and having means for applying adhesive to the bodies.

510+, and other appropriate subclasses for laminating devices combined with cutting means and having means applying liquid material to the work.

524+, for such devices that traverse the work.

529, for means projecting the liquid against the work.

530+, for such devices in which the cutter is actuated by or secured to the laminating element.

546, for apparatus joining indefinite length work edge-to-edge and applying adhesive to the work edge.

547+, for means applying fluent material between the layers of indefinite or running length work.

575, for work traversing devices having means for applying a liquid to at least one of the laminae.

SEE OR SEARCH CLASS:

118, Coating Apparatus, appropriate subclasses for the structure of coating devices, per se, or combined with means there provided for.

579 This subclass is indented under subclass 349. Apparatus in which the laminating device is provided with means adapted to be grasped by the hand of the user for the purpose of manipulating the device.

(1) Note. The devices of this subclass are usually implements used in applying pressure to associated or assembled workpieces.

SEE OR SEARCH THIS CLASS, SUBCLASS:

391+, for work secured or work guided devices which may include a handle to manipulate the device.

523+, for work traversing laminating devices combined with severing means.

574, for work traversing laminating devices having means in addition to the pressure applying means for handling or manipulating the work.

SEE OR SEARCH CLASS:

7, Compound Tools, appropriate subclass, for hand tools with both a laminating roller and a cutting tool.

15, Brushing, Scrubbing, and General Cleaning, appropriate subclasses for implements of the type there provided for. Class 15 provides for brushing, scraping or wiping implements even when disclosed as having a laminating function.

29, Metal Working, subclass 110.5 for roll structures having a manipulating handle.

580 This subclass is indented under subclass 349. Apparatus having means including a solid surface biased against the work to urge the laminae into intimate association with each other.

(1) Note. In this and the indented subclasses may be found inventions relating to the means clamping the work during the setting of the adhesive. Also included are patents in which the solid member wipes along the surface of a lamina to press it into intimate engagement with the base to which it is to be secured.

(2) Note. Laminating presses, per se, of general utility are provided for in Class 100, Presses, appropriate subclasses. That class also provides for presses that are modified by including heating means, cutting means and various other combined treatments provided for in that class. The instant group of subclasses (580+) distinguish from Class 100, Presses, in that the presses or platen surfaces are not of general utility. Thus, included in Class 156 are; (a) relieved or discontinuous surfaces for the purpose of joining laminae in a configured pattern or in a hit-miss manner; (b) platens wherein a limited portion only of the press surface area is heated so that a restricted portion only of the pressed area is joined; (c) wiping devices for smoothing previously associated laminae.

(3) Note. The energy may be applied to the work by way of example, in the form of infrared, X-rays, electrostatic energy or a magnetic field.

(4) Note. Presses or devices for maintaining parts in assembled relationship during bonding when combined with assembling, work handling or treating means for the parts are classified in subclasses above which provide for the various combinations.

(5) Note. Class 100, Presses, provides for laminating presses including working handling means moving a previously assembled sandwich into or out of the press. Thus with respect to Class 100, this class (156) provides for (a) laminating presses combined with means to assemble or bring workpieces into association one with the other (subclasses 538+) or (b) laminating presses in which the press has some characteristic limiting it to a laminating device in accordance with (2) Note above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

358, for laminating devices having means automatically controlling the application of laminating pressure.

475+, for presses in which a part is bent to the configuration of the base to which it is secured.

580.1+, for apparatus having means to treat the work with sonic or ultrasonic waves or vibrations.

SEE OR SEARCH CLASS:

100, Presses, appropriate subclasses, for presses, per se, of general utility, especially subclasses 300+ for a press for attaching a brake pad to a rotor or cylinder of a brake assembly and see (2) Note above.

144, Woodworking, subclasses 256.1+ for press for bending wooden members as they are pressed but having no claimed means which adapts the press to use in adhesively securing to each other a plurality of self-sustaining articles or webs.

269, Work Holders, appropriate subclass as the residual class for work holders or clamps, per se.

580.1 This subclass is indented under subclass 580. Apparatus having means to treat the work by imparting rapid oscillations to the work at a frequency of 10 cycles per second or greater.

580.2 This subclass is indented under subclass 580.1. Apparatus wherein the structure of a work contacting surface which has means subjecting the work to sonic or ultrasonic vibration is specified other than merely flat.

581 This subclass is indented under subclass 580. Apparatus in which the working surface of the element which applies the pressure has either projections or portions thereof recessed, whereby limited portions only thereof apply pressure to the work.

(1) Note. The purpose of these devices is to confine the bonding action to defined areas of chosen configuration by causing pressure to be applied at selected areas only.

SEE OR SEARCH THIS CLASS, SUBCLASS:

290+, for methods of bonding continuously contacting laminae at spaced points only.

553, for work feeding or assembling devices having a discontinuous or patterned press surface.

SEE OR SEARCH CLASS:

144, Woodworking, subclasses 256.3+, for a woodbending press having opposed contoured rigid platens.

582 This subclass is indented under subclass 581. Apparatus in which the pressure applying element is cylindrical in section and rotates about the axis of the cylinder during the pressing step.

SEE OR SEARCH THIS CLASS, SUBCLASS:

555, for presses for continuously joining indefinite or running length webs including work feeding or handling means.

SEE OR SEARCH CLASS:

492, Roll or Roller, for a roll, per se, not elsewhere provided for, and see the notes thereunder.

583.1 Heated:

This subclass is indented under subclass 580. Apparatus in which means are provided for raising the temperature of the press surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

359, for laminating devices having automatic control of the temperature of a heat exchange means.

497, for laminating devices having gas, vapor, or flame contact means for the work.

499, for laminating devices having a separate (nonpress) heating means for the work.

515, for cutting elements that simultaneously laminate including heated cutters.

SEE OR SEARCH CLASS:

44, Fuel and Related Compositions, subclasses 250+ for a flameless or glowless fuel composition, per se, which may be used in a device of this subclass (class 156, subclasses 583.1+).

100, Presses, subclasses 92+ for heated presses there provided for, especially subclasses 300+ for a heated press for attaching a brake pad to a rotor or cyl-

inder of a brake assembly. As between Classes 100 and 156, all tire tube patching presses are considered to be specialized and are proper for Class 156.

126, Stoves and Furnaces, for a nonpress-surface heating device, per se, especially subclass 263 for heating device containing an exothermically reacting composition.

138, Pipes and Tubular Conduits, subclass 98 for hose patch, per se.

144, Woodworking, subclasses 254+ for press for bending wooden members as they are pressed but having no claimed means which adapts the press to use in adhesively securing to each other a plurality of self-sustaining articles or webs.

149, Explosive and Thermic Compositions or Charges, subclasses 37+ for thermite-type compositions.

152, Resilient Tires and Wheels, subclass 367 for a tire patch, per se.

583.2 Impulse heating:
This subclass is indented under subclass 583.1. Apparatus in which heating is of the electrical pulsed type.

583.3 With significantly flexible platen:
This subclass is indented under subclass 583.1. Apparatus in which the flexible or resilient nature of the press surface is specifically defined.

(1) Note. Included herein is flexing of the press surface by a pressurized fluid acting either directly or indirectly on the press surface. Press surfaces indicated as merely flexible or resilient are not here unless the flexible or resilient surface is of a specialized nature. For example, alternating of pressure surface shape between planar and nonplanar during pressure application, plural layers of flexible or resilient material, portion only of press surface contains flexible material, etc.

583.4 Nonuniform heating:
This subclass is indented under subclass 583.1. Apparatus in which the area to be bonded has a temperature gradient along it or the area is bonded in a discontinuous manner.

(1) Note. Included in this subclass are pressure surfaces in which only limited portions of the surface area are heated, e.g., cylindrical rotating members, etc.. Also included are ridged pressure surfaces.

583.5 With endless belt:
This subclass is indented under subclass 583.1. Apparatus which includes an endless belt.

(1) Note. The endless belt may carry heating platens for contact with work or may carry the work through stationary heating platens.

583.6 C-frame type:
This subclass is indented under subclass 583.1. Apparatus having a frame supporting a pressure surface and an opposed cantilever portion of the frame supporting a pressure surface, the reaction force of the compression operation being a thrust against the cantilever support and the opposed frame portion.

583.7 Electric heating:
This subclass is indented under subclass 583.6. Apparatus in which electric heating means is employed.

SEE OR SEARCH CLASS:

100, Presses, subclass 301 for an electrically heated brake press of general utility.

583.8 Hinged platen:
This subclass is indented under subclass 583.1. Apparatus in which the movement of one pressure surface to approach the other is in an arcuate or swinging motion.

SEE OR SEARCH THIS CLASS, SUBCLASS:

583.6, for opposed pressure surfaces moving toward each other along the same axis where the swinging motion of the lever imparts force along the axis.

583.9 Electric heating:
This subclass is indented under subclass 583.8. Apparatus in which an electric heating means is employed.

SEE OR SEARCH CLASS:
100, Presses, subclass 301 for an electrically heated brake press of general utility.

583.91 Plural adjustable pressure points:
This subclass is indented under subclass 583.1. Apparatus in which varying mechanical pressure applied to the material to be bonded is generally applied at two locations opposite to each other and on opposite sides of the material being bonded.

(1) Note. Varying pressure applying means are generally manual screw and bolt type and may include a rod, belt, or plate means therebetween to better distribute the pressure.

(2) Note. Varying pressure application at a single point by thrust against a member rigidly supported at its two ends is also included in this subclass.

584 This subclass is indented under the class definition. Apparatus having means to positively force at least two layers out of bonded relationship one to the other.

(1) Note. The devices must apply a separating force to the parts. The mere destruction of a bond by heat or solvent treatment is not sufficient for this subclass, being provided for in the classes that detail the operation, per se.

(2) Note. Where a blade or sharp tool is used acting along the plane of the bond to force or wedge the laminae apart, the blade must be free-floating to follow the plane of weakness. A device having a rigidly fixed blade, set for a given thickness of cut is provided for in Class 83, Cutting.

SEE OR SEARCH THIS CLASS, SUBCLASS:
344, for delaminating processes, per se.
510, for cutting devices combined with laminating.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 700+ for disassembly apparatus not having means destroying the bond joint.
83, Cutting, and see (2) Note above.
221, Article Dispensing, subclass 73 for dispensing devices having means to strip an article from a magazine strip on which it is carried.

598 This subclass is indented under the class definition. Subject matter and not provided for in any of the preceding subclasses.

CROSS-REFERENCE ART COLLECTIONS

906 OFF-DRUM MANUFACTURE OF TIRE FABRIC OR PLY:
Collection of patents which disclose a process and/or apparatus for the manufacture of tire components prior to the assembly of all components on the tire-building drum.

SEE OR SEARCH THIS CLASS, SUBCLASS:
406.4, for apparatus combining a drum, a conveying means to feed materials to the drum, and cutting, heating, laminating, or shaping means for a lamina upstream of the conveyor.

907 Including assembly of bias-cut fabric:
This subclass is indented under subclass 906. Subject matter which includes the putting together of pieces of fabric which have been cut at an angle to the warp, weft, etc., to form a longer web of fabric.

SEE OR SEARCH THIS CLASS, SUBCLASS:
397, for apparatus for assembling pieces of bias-cut fabric on the tire-building drum.

908 LAMINATING SHEET TO ENTIRE EDGE OF BLOCK AND BOTH ADJACENT OPPOSITE SURFACES; E.G., BOOKBINDING, ETC.:
Cross-reference collection directed to apparatus and process designed to adhesively bond (a) a sheet workpiece, and (b) a block workpiece,

which may itself be a collection of sheets held together in block form, (c) the workpiece being bonded along the entire length of the smallest-dimension side of the block, and (d) the sheet being adhesively bonded, in the product, to at least part of both adjacent opposite sides of the block.

SEE OR SEARCH THIS CLASS, SUBCLASS:

475+, for apparatus for adhesively bonding workpieces, including means to configure a lamina to the shape of the part to which it is secured.

909 APPARATUS FOR APPLYING NEW TREAD TO USED TIRE CASING; E.G., RETREADING, RECAPPING, ETC.:

Apparatus for laminating a new tread, or tire portion to a used tire carcass wherein the new tire component is preformed and not reshaped by the laminating apparatus.

(1) Note. This cross-reference art collection provides for generally annular and/or toroidal shaped envelopes, or devices placed around a retreaded tire to hold (but not reshape) the new tread portion against the tire carcass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

94+, for methods of repairing or renewing tires.

381, for apparatus having walls completely surrounding the work, which walls form a space within which the work is bonded and which are separable from laminating pressure surfaces.

421.2, for apparatus which includes either (a) a chamber incompletely surrounding the tire casing, or work with a means for establishing pressure within the interior of the chamber, or (b) a chamber completely surrounding the work which is, or becomes inseparable from the laminating surfaces with a means for establishing pressure within the interior of the chamber.

584, for devices for removing tread stock, beads and piles from a tire carcass or for removing adhered tires from rims.

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, subclasses 104+ for apparatus for drying a hollow article, e.g., a tire, etc.

157, Wheelwright Machines, subclass 13 for devices for grooving, slitting, or lacerating rubber tires, or tire bodies; and subclasses 14+ for means which hold at least one component of a wheel in a particular position, or orientation either relative to (a) another component of the wheel when the wheel is assembled, or disassembled, or (b) a repairing, or surfacing tool working on the tire component of the wheel.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclass 326 for reshaping toroidal shaped work pieces.

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, appropriate subclasses, for heated reaction vessels, or autoclaves.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 17+ for tire recapping, rebeading, or sidewall replacing means.

451, Abrading, for an abrading process performed on a tire casing (e.g., as a preparation for recapping, etc.) and for an apparatus therefor.

910 BONDING TIRE CORD AND ELASTOMER: IMPROVED ADHESIVE SYSTEM:

This subclass is indented under the class definition. Collection of patents which disclose improved systems for obtaining a bond between a textile lamina and a rubber or synthetic resin lamina in the manufacture of tires.

(1) Note. The textile maybe a mechanically interengaged thread system or now oven type, may be metal or nonmetal, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

307.1+, for a process of adhesive bonding which includes vulcanization, crosslinking or other curing phenomenon, especially subclasses 307.3+ for

those which include coating or impregnating a face to be adhered.

912 DIFFERENTIAL ETCHING APPARATUS HAVING A VERTICAL TUBE REACTOR:

Art collection involving differential etching apparatus constructed as a vertical tube reactor having a means for holding a plurality of vertically stacked workpieces.

913 DIFFERENTIAL ETCHING APPARATUS HAVING A HORIZONTAL TUBE REACTOR:

Art collection involving differential etching apparatus constructed as vertical tube reactors having a means for holding a plurality of horizontally stacked workpieces.

914 DIFFERENTIAL ETCHING APPARATUS INCLUDING PARTICULAR MATERIALS OF CONSTRUCTION:

Art collection involving differential etching apparatus constructed from particular materials of patentable significance.

915 DIFFERENTIAL ETCHING APPARATUS INCLUDING FOCUS RING SURROUNDING A WAFER FOR PLASMA APPARATUS:

Art collection involving differential etching apparatus having a focus ring surrounding a wafer for concentration of plasma.

916 DIFFERENTIAL ETCHING APPARATUS INCLUDING CHAMBER CLEANING MEANS OR SHIELD FOR PREVENTING DEPOSITS:

Art collection involving differential etching apparatus constructed with means to clean a processing chamber or prevent deposits therein.

917 DIFFERENTIAL ETCHING APPARATUS HAVING A BARREL REACTOR:

Art collection involving differential etching apparatus constructed as a barrel reactor having a means for circumferentially mounting a plurality of workpieces on a cylinder.

END